MARITIME LITERACY
TEACHER'S BOOK
A PREPARATORY VET COURSE

MARITIME
LITERACY

Contents

MODULE 4 - SAFETY ON WATER

MODULE 5 - ECOLOGY

This Teachers book was developed as part of the project 'Maritime Literacy – A preparatory VET Course', funded by the European Commission's Erasmus+ Programme and implemented through a collaboration with the following organisations:

FGU Østjylland (Denmark)

InterCollege ApS (Denmark)

Sea Teach (Spain)

Kocaeli Provincial Directorate of National Education (Turkey)

International Internships (Romania)

Course objective

To provide basic, yet holistic Maritime competence to students enrolled on various vocational education and training (VET) programmes. Thus, providing learners with a basic maritime literacy that can be taken forward into any further education or work that is related or connected to seas, oceans, coasts, and inland waterways.

Pre-Requisite

Although this course is designed for students who are beginners to the maritime world it is assumed that the teachers have a level of knowledge and experience to explain, for example, the concept and details of navigation and therefore be able to offer a variety of scenarios to explain the subject to the learners. It is also expected that for specific Modules such as First Aid or Sea Survival Training, a professional instructor is employed to deliver the course content as there are dangers or risks if certain procedures are not followed correctly.

Introduction

The Maritime Literacy course is presented in three documents:

> **The Syllabus.**
>
> **The Teachers Book: Methods and Activities.**
>
> **The Evaluation Rubric**

In the **Teachers Book** (this document), the course is presented in 5 Modules. Each Module is broken down by Activities. A variety of teaching/training Methods are used in the activities to offer pedagogical diversity within the course. The teaching/training methods used with in the course are described below.

From the **Syllabus**, each activity has been given an ID Number. Each ID number refers to the activities listed below within each teaching module. This is how this document connects to the syllabus.

The Evaluation Rubric completes the teacher resources of the Maritime Literacy course. The document is designed to offer the teacher a framework for recording and monitoring student's progress through the course.

Scan the QR code to download The Syllabus and The Evaluation Rubric.

Within this Teacher's book, the course and its training/teaching activities are presented in Module tables. Each table has 7 titled columns:

1. Activity ID

This column refers to the ID number of each activity in the Syllabus.

2. Method & Activity Description

This column represents which teaching methods and activities have been chosen. The teaching method is displayed in bold and activity in displayed in italic.

Methods

The teaching methods refers to the general principles, pedagogy and management strategies used for teaching/training instruction. The teaching methods for this course have been selected by considering different educational philosophy, classroom demographic, subject area(s) and school mission statements in order to attend diversity and focus on the projects target group. These methods are listed below.

Activity

The activities are the means used by the teachers to develop the programmed contents and the achievement of the learning objectives. Activities enhance students', knowledge, skill, and attitude in a specific area by engaging multiple teaching methods. Activities also serve to infuse fun into learning as well as bolster student confidence and the ability to think critically.

The methods and activities used in this course are designed to incorporate an approach inspired by non-formal learning, whereby students develop a reflective understanding of what they learned, can recognise links between the different learning outcomes and can independently identify practical ways in which to apply the learning.

In the context of this course, non-formal learning should be interpreted in such a way that the learning is based on how it is in practice in a maritime environment. It is most effective if the teaching can take place in a maritime environment, but it cannot always be done, so therefore if the teaching takes place in the classroom, examples should be given from everyday life at a port or a ship and the like. It can either be the students who can come up with the examples or it may be the teacher.

Each activity should start with the learners reflecting on what they see in the activity content and why they need to know something about that topic. Likewise, each activity should end with the students reflecting on what they have learned.

The Teaching/training methods

a. Direct Instruction: A general term that refers to the traditional teaching strategy that relies on explicit teaching through the direct delivery of information and teacher-led demonstrations. In this method of instruction, the teacher might play one or all the following roles: Formal authority, expert, and personal model. The course uses direct instruction in some activities to provide a diversity of styles and meet different learning needs. As the course intends to support a non-formal, reflective approach to learning, the use of direct instruction has been reinforced either through a guidance for facilitating learning reflection or through directly following up on the activity with a second activity that utilizes a more interactive teaching method.

b. Experiential learning: A process whereby knowledge, skill, and attitude is created through the transformation of experience. The knowledge, skill, and attitude results from the combinations of grasping and transforming the experience. The learning in this model includes multiple content areas so that students can see how problem-solving can happen in the real world.

c. Flipped classroom learning approach: A teaching structure whereby students engage in self-study at home and complete in-class assignments, as opposed to receiving the information in class and executing the learning at home/outside of the class. Teachers who implement the flipped classroom model often film their own instructional videos, but many also use pre-made videos from online sources. A key benefit of the flipped classroom model is that it allows for students to work at their own pace if that is how the teacher chooses to implement it. In some cases, teachers may assign the same videos to all students, while in others, teachers may choose to allow students to watch new videos as they master topics, taking on a more "differentiated" approach.

d. Game based learning: A teaching method that comes from the desire to engage students in more active learning in the classroom. Games are a great way to encourage a "mastery" mindset, rather than a focus on grades and can support the students to be problem solvers and develop soft skills that they will need in future employment or further education. In a game-based learning environment, students work on quests to accomplish a specific goal (learning objective) by choosing actions and experimenting along the way.

e. Hands-on learning: A teaching method where students perform physical, 'hands-on' activities rather than listen to presentations or watch demonstrations.

f. Project-based learning: Project Based Learning is a teaching method in which students gain knowledge and skills by working together for a period of time to investigate and respond to an authentic, engaging, and complex question, problem, or challenge. This style of teaching encourages the student to work together to respond to a problem or question set by the teacher.

This column provides indicators of what knowledge, skill and/or attitude the students are expected to either acquire or develop through participating in the activity. The learning objectives of each activity have been identified to address the curriculum objectives of the 5 modules, which are presented in the Syllabus.

The Learning objectives are based upon the attainment of three types of learning:

The knowledge, skill and attitude acquired or improved though the training/teaching activities support the attainment of the competence based curricular objectives.

As presented in the model below, the course is based on an approach that does not prioritise between knowledge, skill, and attitude, but rather recognises their inter-relation and the importance of all three in building competence.
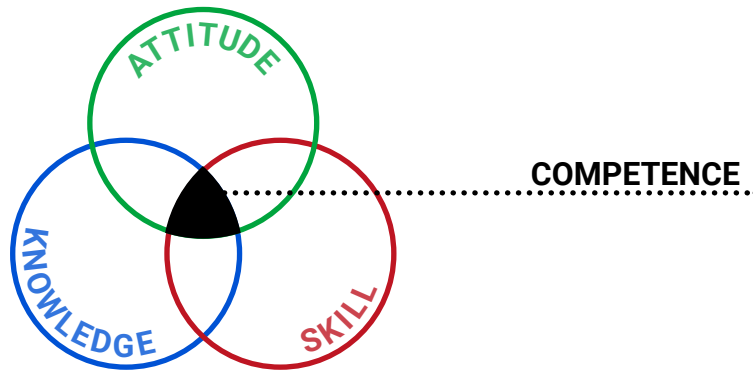
This approach is based upon a theoretical framework for categorising educational goals that is commonly referred to as 'Bloom's Taxonomy' where learning is grouped into three categories: cognitive domain, psychomotor domain, and affective domain.

This approach has been adopted broadly across different learning spectrums, albeit under varying interpretations. The 'Cognitive domain' is consistently understood as knowledge-based learning, and 'psychomotor domain' as skill-based learning.

However, the affective domain is more open for interpretation, and is regularly understood as either attitudinal learning, ability, or competence.

In the framework of this course the affective domain has been interpreted as attitudinal learning, and competence has been understood as the combined application of knowledge, skill, and attitude. The course defines and uses 'knowledge', 'skill', 'attitude', and 'competence' as follows:

Knowledge

In reference to the student's retainment and understanding of information. The course's learning objectives delineate knowledge learning into five levels that build upon each other, as follows:

> **Basic knowledge – the acquisition and retainment of basic information**
>
> **Understanding – the reflective comprehension of the information retained**
>
> **Application – the applied use of the of the retained information**
>
> **Analysis – the reflective analysis and dissection of retained information**
>
> **Synthesis – the reflective linkage and integration of different retained information**

Skill

In reference to the student's ability to practically undertake an action, for example, tie a bowline knot. Within the scope of this course, students are expected to develop basic maritime related skills.

Attitude

When referring to attitude, the course is not intending to focus on 'good' or 'bad' attitude, but rather an attitudinal approach or value that the students have developed through experience, such as calmness, attentiveness, openness, flexibility. The course focusses upon attitudinal learning to encourage students to build a connection to maritime culture and values and ensure they can combine their skill and knowledge effectively in a given situation.

Competence

In reference to the combined application of the acquired or developed knowledge, skill, and attitude. The course's intention is to provide the students with the possibility to acquire the needed knowledge, skill, and attitude for developing basic and holistic Maritime competence, or otherwise referred to in this course as 'Basic Maritime Literacy'.

4. Instruction:

The text offered in this column explains in more detail content of the learning activity and provides step by step guidance to the teacher on its delivery. The instruction also provides, where necessary, suggested questions for supporting the students learning reflection through de-brief and discussions.

NOTE on De-briefs and Discussions: De-briefing and discussions are an important element of the course which refer to a conversational exercise that takes place in plenary or in groups at the end of an activity. The teacher poses questions to the students to encourage them to reflect upon the information received, and situations experienced, during the activity. Suggested questions are provided to support the teacher in facilitating de-briefs and discussions, however if the students find it difficult to discuss the questions, the teacher should offer further support by asking the question in a different way or reminding the students of the relevant part of the undertaken activity.

In some activities, de-briefing and discussion questions have not been provided. In such cases the learning reflection is either considered to be comprehensively incorporated into the activity or is comprehensively provided in an activity that follows.

5. Materials/Equipment

These items are listed as teaching aids to support the explanation and learning of the content.

6. Notes for teachers

This column offers information to help the teacher prepare prior to the session ahead.

SEAMANSHIP

4 DAYS (20 HOURS) OF TEACHING/TRAINING, COVERING:

A. History of seafaring

B. Reading the sea

C. Sectors and activities related to water

D. Knots

E. Types of boats and vessels

F. Maintenance of boats and vessels

G. Understanding of engines and sails

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/EQUIPMENT	NOTES FOR TEACHERS	TIME
1	**Direct Instruction:** Teacher led presentation & timeline exercise on history of seafaring.	Basic Knowledge upon how seafaring activity developed through the ages. Basic Knowledge upon how the different types of vessels developed according to their use and purpose through the ages. Basic Knowledge upon the terms/names for basic parts of different vessels through the ages.	**Step 1** (*15 mins.*): Begin the activity by facilitating a brainstorm. Ask the students the following questions and write down the answers on a whiteboard/flipchart: ‣ What uses of vessels can you think of? ‣ In which ways can vessels be propelled? ‣ What types of vessels can you name? **Step 2** (*45 mins.*): Follow-up on the brainstorm with a presentation to introduce maritime history and give an outline of the origin of, and up to, present day maritime activity. Include the different types of seafaring activity and the related vessels and the parts of different vessels. It is recommended to use the listed supportive materials such as globes, maps etc. **Step 3** (*30 mins.*): Ask the students to work in groups to draw up a timeline of the types of ships that have been used over time.	The following materials may be used to support the presentation of information in step 2: ‣ Projector & laptop ‣ Maps ‣ Globe ‣ Atlas ‣ Reference books. ‣ Videos **SCAN THE QR CODE FOR AN EXAMPLE POWERPOINT PRESENTATION USED IN DENMARK:** The following materials may be used by the students in step 3: ‣ Paper ‣ Coloured markers	Prepare a variety of alternative content examples to help explain to those students who may have not understood during the first presentation. For example, some students may need a refresher of basic geography to understand the content of the activity. Ensure that the presentation in step 2 introduces students to different vessel types, purposes, and parts throughout history: so that the students have the knowledge required to take part in the following activity (Activity 2).	1,5h

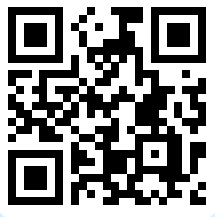| ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/EQUIPMENT	NOTES FOR TEACHERS	TIME
2	**Game based learning:** Online games to identify types of vessels according to different periods in history.	Applied knowledge of how seafaring activity developed through the ages. Applied knowledge of how different types of vessels developed according to their use and purpose. Applied knowledge of the terms/names for basic parts of different vessels. Recognition of the importance of understanding the history of seafaring.	**Step 1:** Divide the students into groups (2-5 students per group). **Step 2** *(20 mins.):* Ask the groups to go to H5P.org or kahoot.com and develop their own game to test their peers on the content from previous activity (different vessel types, purposes, and parts throughout history). **Step 3** *(20 mins.):* Ask the students to play each other's games on rotation. **Step 4** *(20 mins.):* Discussion - Ask the students the following questions in groups or in plenary: 1. Why is it important to know the history of seafaring? 2. What can seafarers of the history teach us today? 3. Where will seafaring be in 100 years from now? 4. What can you use this knowledge for? How can you use it?	Computers or mobile devices with access to the internet	Be mindful that some students might be new to IT and may need extra support with the basic functionality of the computer or tool used. Be familiar with h5p.org or kahoot.com prior to the activity to be able to support the students in developing their own online games. Any alternative online-game platform may be used in the activity.	1h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/EQUIPMENT	NOTES FOR TEACHERS	TIME
3	**Direct Instruction:** Basic meteorological forecasting and weather map reading activity.	Appreciation of the importance of understanding the weather, particularly the wind and the effects and dangers of storms. Applied knowledge upon where to obtain weather forecasts. Basic knowledge of map reading. Basic knowledge to understand low pressure and high pressure. Basic knowledge to understand the Beaufort scale and the effects of wind on water.	**Step 1** *(15 mins):* Start the activity by facilitating a brainstorm. Ask the students the following questions and note down the answers on a whiteboard/flipchart: ▸ Why it is important to know what the weather will be like when you go sailing? ▸ Where can we find out what the weather will be like? **Step 2** *(15 mins):* Provide some resources and examples of free to download weather apps for students to use and understand regarding weather forecasting. Briefly introduce the Beaufort scale to the students using reference books/ print outs/Videos.	**For step 1:** ▸ Mobile devices with access to the internet **For step 2:** ▸ Reference books ▸ Printouts ▸ Videos **SCAN THE QR CODE FOR A PRINTOUT OF THE BEUFORT SCALE (IN ENGLISH AND DANISH)** **SCAN THE QR CODE FOR EXAMPLE VIDEOS THAT MAY BE USED TO SUPPORT LEARNING** 	Check if parental permission is required regarding the use of mobile devices.	**0,5h**

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
4	**Experiential learning:** Visit the coast, to experience the effects of the wind on the sea state.	Applied knowledge and skill to be able find and interpret a weather forecast. Basic knowledge of wave types and skill to be able to describe basic wave types. Knowledge and skill to be able to describe wind differences, wind directions. Understand the effects and dangers of storms. Appreciation of the importance of understanding the weather, particularly the wind and the effects and dangers of storms.	Transport to the location (Either coastal, lakeside or river side) **Step 1:** On route to location – Facilitate a discussion with the students regarding the subject to outline the day ahead. **Step 2:** Upon arrival, provide a clear security briefing to the students. **Step 3:** *(30 mins):* Divide the students into groups (2-5 per group) and give the groups the task to find a weather forecast for different locations and from that, observe the effects of the wind on the water. **Step 4:** Provide the students with handouts that explain wind speed and describe wind differences and wind directions. **Step 5** *(30 mins):* Ask the groups to find out what the basic wave types are and what influences the wave height. They must also explain what the danger is of a storm. **Step 6** *(20 mins):* Ask the groups to present their results to each other in plenary. **Step 7** *(10 mins):* Discussion - Ask the students the following questions in groups or in plenary: 1. What did you know before about the subject? 2. Did you think the sea was affected in other ways? 3. What can you use your new knowledge and skill for? How can you use it? Consider putting groups of two and two together so that they in pairs discuss what they have learned.	Notepads Pens Mobile devices with internet access Handouts on wind speed, wind differences and wind directions **SCAN THE QR CODE FOR EXAMPLE HAND OUT ON WIND DIRECTION** 	This activity should be carried out either at a coastal, lakeside or river side location. Research and prepare various suitable locations to carry out the excursion. Pre organise transport for the visit. Consider refreshments/ lunch for the students during this half day session. Consider a risk assessment policy regarding the excursion. Check if parental permission is required regarding the excursion and the use of mobile devices.	**2h**

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
5	**Direct Instruction:** Student led presentations to show examples of different types of ships.	Reflective knowledge of the maritime sector and what job opportunities there are within the sector.	**Step 1** *(10 mins.):* Start the activity by facilitating a brainstorm. Ask the students the following questions and note down the answers on a whiteboard/flipchart: ▸ What maritime sectors do you know? ▸ What are the different maritime sectors doing? Conclude the brainstorm with a summary of the two primary Maritime sectors, 'Shipbuilding Sector', and Recreational Craft Sector'. **Step 2** *(20 mins.):* Divide the students into groups (2-5 students per group, and a maximum of 4 groups). Ask each group to select one of the two maritime sectors discussed in step 1 and make a PowerPoint presentation where they describe their chosen sector. They must describe the following: ▸ The types of ships the sector use. ▸ The types of job opportunities in the sector. **Step 3** *(20 mins.):* Ask each of the groups to present their results to the other groups. In the case that the students are uncomfortable to present to all their peers in plenary, ask the groups to present to each other, on a group-to-group basis instead. **Step 4** *(10 mins.):* Follow up on the group presentations, ensuring to elaborate on any details or important information that was missing in the presentations.	Reference Books Computers/laptops		**1,5h**

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
6	**Game based learning:** Simulator game to determine rules, regulations, and relationships between different vessels.	Applied knowledge of different types of ships and their relationship and priority to each other.	**Step 1** *(50 mins.)* Through game-based methodology, make use of the website: https://ecolregs.com/ The website provides a training simulator that offers interactive scenarios that explain rules and regulations and teaches the differences between the vessels at sea regarding the rules. Direct the students (either individually or in pairs) to specific parts of the website to learn relevant rules and regulations relating to the relationships between vessels at sea. **Step 2** *(10 mins):* Discussion - Ask the students the following questions in groups or in plenary: 1. What did you know before about the subject? 2. How many types of ships did you know before? 3. How can this knowledge be useful? Consider putting groups of two and two together so that they in pairs discuss what they have learned.	Computers/laptops with internet access (at least one per two students)	Become familiarised with the tools on the website beforehand: https://ecol-regs.com/. Be mindful that some students may be unfamiliar with the use of IT tools and may need support with the basic functionality of the computer or tool used. The Ecolregs website is available in English and Spanish only. As an alternative to the online simulation-based learning. You could consider recreating scenarios using physical models, such as print outs of various boats stuck onto wooden blocks or use your school's 3D printer to make models of various boats. **SCAN THE QR CODE FOR 3D PRINATBLE BOAT MODELS**	**1h**

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
7	**Flipped classroom learning approach:** Student led presentations to teach their fellow students different knots.	Reflective knowledge of the names and uses of four different knots. Applied Knowledge and skill to tie four different knots. Sense of responsibility, leadership & teamwork.	**Step 1** *(10 mins.):* Ask in plenary if anybody know any knots and if so, ask them to demonstrate the knots they know to the rest of the class? **Step 2** *(1 hour):* Divide the students into four teams. Designate one or two types of knots to each team. Provide handouts, video links, and materials (ropes) to each team and ask them to prepare presentations to teach their knots to their fellow students. Explain to the teams that they can prepare different methods to teach their peers the knot, such as a competition or speed test. **Step 3** *(1 hour):* Explain that each team has 15 minutes to teach their fellow students how to tie the knot and explain the background and uses of the knot. Agree with the groups which order they will present in. During the group's presentations, observe and only facilitate where strictly necessary. **Step 3** *(15 mins):* Discussion - Ask the students the following questions in groups or in plenary: 1. What did you not know before about the subject? 2. What are the names of the knots that you have learnt? 3. Can you demonstrate a knot that you have learnt today? 4. Within your group discuss the purpose of the different knots you have learnt 5. Are there other situations where these knots could be useful? Consider putting groups of two and two together so that they in pairs discuss what they have learned.	▸ Computers/laptops/tablets ▸ Ropes of different diameter, texture, and length. ▸ Handouts/diagrams/video instructions for 4 – 8 different knots **SCAN THE QR CODE FOR TASK SHEET USED IN DENMARK – AS AN EXAMPLE OF WHICH KNOTS CAN BE DESIGNATED TO THE TEAMS, AND EXAMPLE INSTRUCTIONAL VIDEOS WHICH CAN BE USED.**	Prepare video links, teaching materials and ropes. This flipped classroom approach will mean the teacher should observe and make notes and provide a conclusion back to the class regarding success or problems encountered. Use the activity as an opportunity to observe and comment on the student's teamwork. Encourage the students to formulate and strengthen leadership skills and attitudes amongst the groups which is important in the maritime sector.	**2,5h**

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
8	**A combination of direct instruction and game-based learning:** Online games to identify different examples of each boat category.	Applied Knowledge and skill to identify the various types of vessels. Applied Knowledge and skill to identify the parts of the boat.	**Step 1** *(20 mins):* With the support of hand-outs or a presentation, explain the official differences **Step 2** *(20 mins):* Divide the students into pairs and ask them (in their pairs) to create a game to test their fellow students on the different parts of the ship in an interesting way. You may suggest to the students to use H5P.org or kahoot.com to create their game or they may wish to use a different means (digital or non-digital) in which to create their game. They could for example use kahoot.com to create a visual quiz, in which 'zoomed-in' images of parts of vessels are shown and fellow students should try and guess what the image is. **Step 3** *(20 mins):* Ask the pairs to play the games created by the other pairs.	▸ Computers/lap-tops/tablets with internet access ▸ Pre-prepared handouts or slides to support in explaining the official differences between vessels. **SCAN THE QR CODE TO SEE AN EXAMPLE PRESENTATION USED TO SUPPORT THE TEACHING AND DIALOGUE WITH PARTICIPANTS**	Be mindful that some students might be new to IT and may need extra support with the basic functionality of the computer or tool used. Be familiar with h5p.org or kahoot.com prior to the activity to be able to support the students in developing their own online games. Any alternative online-game platform may be used in the activity.	**1h**

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
9	**A combination of direct instruction and experiential learning:** Visit the local port/marina to identify different examples of each vessel category.	Deepened knowledge of the official categories of vessels. Deepened knowledge of the names of the main vessel parts. Improved observational skills.	Transport to the port or marina. **Step 1:** On route to location facilitate a discussion with the students, asking the following questions: 1. Does anybody know any names of boat parts? 2. If so, what parts do you know the names of, and what are those parts used for? **Step 2** *(30 mins):* Upon arrival conduct a safety briefing in cooperation with the port/marina master/manager. **Step 3** *(45 mins):* Explain to the students the different types of vessels that can be seen at the port/marina and ask the students to take photos or make drawings of the vessels and the boat parts. **Step 4** *(15 mins):* Discussion - Ask the students the following questions in groups or in plenary: 1. Does anyone know any names of boat parts? 2. Which parts did you see today at the marina? What are those parts for? 3. What types of vessels did you see at the marina today? Consider putting groups of two and two together so that they in pairs discuss what they have learned.	‣ Notepads ‣ Pens ‣ Pencils ‣ Phones/cameras/ tablets	This activity should be carried out at a local port or marina. If it is not possible to conduct the activity on location, alternatively use YouTube videos and slide presentations of the various types of vessels. Times indicated do not include travel time to and from the port or marina. Pre organise transport for the visit. Research and prepare various suitable locations to carry out this visit excursion. Consider refreshments/ lunch for the students during this half day session. Conduct a safety briefing together with port/marina manager/master to give the students an opportunity to receive information from someone other than their teacher. Consider a risk assessment policy regarding the visit activities. Check if parental permission is required regarding the excursions and the use of mobile devices.	1,5h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
10	**Experiential learning:** Visit to a shipyard or marina workshop to see how maintenance is done.	Basic knowledge of general boat maintenance. Basic knowledge of boat engines including the control on the fuel system, electricity, cooling, and lubricating oil system. Knowledge, skill, and attitude to recognise and appreciate good seamanship in connection with boat maintenance.	Transport to the marina workshop or shipyard. **Step 1:** On route to location facilitate a discussion with the students, asking the following questions: 1. What is boat maintenance? 2. Why is it important? **Step 2** (20 mins): Introduce the students to the staff at the workshop and ask the students to briefly introduce themselves. Conduct a safety briefing together with staff at the workshop. **Step 3** (1 hour): Give the floor to the staff at the workshop/shipyard to provide demonstrations to the students regarding various maintenance repair and servicing methods. Encourage the students to ask questions to the staff and to take notes. Where necessary, support the staff in answering the student's questions. **Step 4** (10 mins): De-brief - Ask the students the following questions in groups or in plenary: 1. What is boat maintenance? 2. Why is boat maintenance important? 3. What generally did you learn today? 4. Can you identify the maintenance considerations for various systems onboard the vessel? For example, the hull, propellers, engines, lubricants, electrics, etc. Consider putting groups of two and two together so that they in pairs discuss what they have learned.	‣ Notepads ‣ Pens	This activity should be carried out at a local marina workshop or shipyard. Pre organise transport for the visit. Discuss the purpose of the activity with the staff at the workshop prior to the activity. Times indicated do not include travel time to and from the marina workshop or shipyard. In the case that it is not possible to visit a workshop or shipyard, as an alternative, take the students to a boat winter storage to observe the boats out of water, and facilitate a discussion about their general condition and together with the students, identify maintenance issues. Consider how many students can attend the activity whilst maintaining an effective and safe learning environment. It may be necessary to divide the students into smaller groups and conducted the activity with each group. Consider a risk assessment policy regarding the excursion and whether students are required to wear protective gear whilst at the workshop. Consider refreshments/lunch for the students during this half day session. Check if parental permission is required regarding the excursion	1,5h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
11	**Game based learning:** Finalise the structure and content of the boat category game.	Applied Knowledge and skill to observe and identify various types of vessels. Applied knowledge and skill to observe and identify the parts of the boat. Strengthened digital skills. Strengthened teamwork skills.	**Step 1** *(25 mins):* Upon returning from the port, yard, or marina, ask the students to finalise and upload their drawings and photos (taken during activity 9) to the online games that they made in the morning activity (activity 8). **Step 2** *(20 mins):* Instruct the students in their groups to play each other's updated games. **Step 3** *(15 mins.)* Discussion - Ask the students the following questions in plenary: 1. What is good maintenance of a boat? 2. Why should you maintain a boat? 3. What ship types do you know? 4. What can you use the knowledge from today for? How can you use it?	▸ Computers/laptops ▸ Tablets/Mobile phones/Scanner	In this activity, the students will return to the pairs they worked in during the morning activity (activity 8). During the group work, ensure to offer facilitation, provide IT support where needed and monitor that the content of the student's games are accurate.	1h

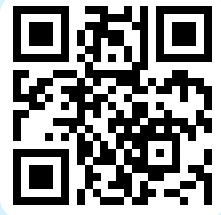| ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
12	**Project based learning:** Student led research projects to determine type and principles of power and sailing vessels.	Knowledge of the different types of power and sailing vessels. Knowledge for understanding the advantages and disadvantages of the two different types of vessels. Strengthened teamwork skills. Strengthened communication skills.	**Step 1** *(2 hrs 30 mins):* Divide the students into two groups. Each group will be responsible for researching about either power or sail boats and will design a presentation to demonstrate to the other group. **Step 2** *(2 hours):* Ask the groups to present their topic to each other. The student's presentations may include an element of competition, for example, the group presenting 'Sail Boats' may try to suggest that sailing is better because…… This could add a fun factor to the task and keep the students engaged. **Step 3** *(30 mins.):* Discussion - Ask the students the following questions in plenary: 1. Is it possible to do without one type of vessel (wind or power) - Why, Why not? 2. How do you think it will look in 100 years? 3. What are the advantages and disadvantages of power boats? 4. What are the advantages and disadvantages of sail boats?	▸ Computers ▸ Projector ▸ Reference books	During the group work, ensure to offer facilitation, provide IT support where needed and monitor that the content of the student's presentations are accurate. Encourage the students to be creative in their presentations, they may choose to use digital tools (i.e. Prezi.com), use theatre, or make a quiz. Consider presenting a prize to the best presentation.	5h

COMMUNICATION ON WATER

4 DAYS (20 HOURS) OF TEACHING/TRAINING, COVERING:

A. **Introduction to Radio Etiquette**

B. **Morse Code**

C. **Signs, Sounds and Flags**

D. **Lights**

E. **Visit to Ports and Marinas**

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
13	**Direct Instruction:** Teacher led presentation of communication at sea.	Knowledge to understand how to communicate at sea and what means of communication to use.	**Step 1** *(15 mins.):* Start the activity by facilitating a brainstorm. Ask the students the following questions and note down the answers on a whiteboard/flipchart: ▸ What communication do you know about which can be used at sea? ▸ What are the pros and cons of the different communication methods? **Step 2** *(45 mins.):* Follow up the brainstorm with a presentation to introduce maritime communication. Include the different types of maritime communication, including signal flags, lantern, and maritime radio. The focus of the presentation should be on maritime radio and the basic protocol to receive and transmit radio messages correctly.	**Materials to support the presentation (step 2), such as:** ▸ Projector & laptop ▸ Printed learning material ▸ PowerPoint presentation ▸ Reference books ▸ Videos	The activity should be conducted with the assumption that students have zero pre-knowledge of the subject. The following activity (14) consist of exercises for the students to complete by using the information they have been presented in this activity. Therefor it is important to be familiar with the follow-up activity and ensure the presentation in this activity provides the students with the needed information (Eg. Understands basic protocol to receive and transmit radio messages correctly).	1h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
14	**Hands-on learning:** Online simulator - radio communication	Applied knowledge and skill to describe how a VHF radio works, including making a DSC call. Applied knowledge and skill to use the phonetic alphabet to spell and use the right pro-words.	**Step 1** *(5 mins.):* Ask the student to download the app VHF Trainer Lite. **Step 2** *(30 mins.):* Ask the students to review the Learner module in the app. Tell the students to focus of the following topics: ▸ How a VHF radio works. ▸ DSC call **Step 3** *(10 mins.):* Review the phonetic alphabet and pro-words with the students **Step 4** *(30 mins.):* Ask the student to practice radio communication in pairs via the simulator in the app. Provide the students handouts with signal exercises which the students must send to each other. **Step 5:** *Discussion (15 mins.):* - Ask the students the following questions in plenary: 1. What is important to consider in connection with radio communication at sea? 2. What to do and what not to do in connection with VHF communication? 3. What can you use this knowledge and skill for? 4. Who is it possible to call though VHF radio?	▸ Mobile devices (smartphones or tablets) ▸ Handouts with prowords (for step 3) ▸ Handouts with signal exercises (for step 4) **SCAN THE QR CODE TO SEE AN EXAMPLE HANDOUT WITH PRO WORDS (IN English & Danish)** **SCAN THE QR CODE TO SEE AN EXAMPLE RADIO SIGNAL EXERCISE (In English & Danish)** 	Prepare simulators beforehand – for example, the mobile application 'VHF Trainer Lite' - a free version available on App Store and Play Store. Listen to maritime English pronunciation examples online in preparation for the activity.	**1,5h**

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
15	**Direct Instruction:** Teacher led presentation to introduce Morse Code.	Basic knowledge of Morse code. Appreciation of the historical importance of Morse code.	**Step 1** *(40 mins.):* Present the students with an introduction to the history of Morse code highlighting that Morse code is now discontinued, but the SOS system still applies in distress situations. **Step 2** *(20 mins.):* Ask the students to work in pairs to brainstorm as many ways as possible upon how to send a message via Morse code (e.g., audio tone, visual cues, touch, or pressure). Ask the groups to share their findings in plenary.	**Materials to support the presentation (step1), such as:** ▸ Printed learning material ▸ Videos ▸ Projector & laptop ▸ PowerPoint presentation **SCAN THE QR CODE TO SEE AN EXAMPLE POWERPOINT PRESENTATION**		**1h**

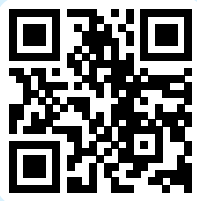| ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
16	**Hands-on learning:** Online Morse Code simulator.	Knowledge of how Morse code sounds. Basic skills in Morse code, including how to formulate Morse code and how to translate it alphabetically. Applied knowledge and skill to make an SOS message in Morse Code.	**Step 1** *(15 mins):* Divide the students into pairs and ask them to download a morse code simulator app. Ask the students to play with the app and become familiar with it. **Step 2** *(1hr):* Tell the pairs to find another pair to send messages to. Ask the pairs to send SOS via Morse code to each other using a handout for help. Ask the pairs to send each other different messages using morse code. Explain that the pair receiving the message should note it down, and the other pair should check if they got it correct. Ask the pairs to send SOS via Morse code to each other again but without using the handouts as support. **Step 3** *(15 mins):* Discussion - Ask the students the following questions in groups or in plenary: 1. What can Morse code be used for? 2. Can you give some examples of how an SOS can be given? 3. What did you know before about the subject? 4. What can you use this new knowledge and skill) for? How can you use it? Consider putting groups of two and two together so that they in pairs discuss what they have learned.	▸ Computers or mobile devices to access and use the Morse code simulator ▸ Handout of alphabet in Morse code	In preparation for the activity, source a suitable Morse code simulator (such ase the mobile application 'morsekey') to help students practice the Morse Code.	1,5h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
17	**Direct Instruction:** Teacher led presentation of signs, sounds, and flags.	Applied knowledge and skill to recognise and understand the significance and meaning of the signs. Applied knowledge and skill to recognise and understand the meaning of sound signals and flags.	**Step 1** *(30 mins):* Start the activity by facilitating a brainstorm. Ask the students what they can remember in relation to different means of communication at sea that are not radio telephony. Note down the answers on a whiteboard/flipchart. Ask the students if they can re-call the pro and cons of the different means of communication. **Step 2** *(1 hour):* Follow up the brainstorm with a presentation to introduce signs, sounds, and flags as methods of how vessels communicate with each using various systems other than voice communications. Provide a short task for the students to create words using signal flags. **Step 3** *(30 mins):* Demonstrate how the signs appear depending on day or night view. Create different scenarios with the signs and ask the students to determine the meaning. Support them where necessary. Ask the students to try and create different scenarios with the signs. **Step 4** *(30 mins):* Use a simulator to demonstrate sound signals. Ask the students to determine the meaning of the different sound signals demonstrate. Support them where necessary.	**Materials to support the presentation (step2), such as:** ▸ Projector & laptop ▸ PowerPoint presentation ▸ Videos ▸ Reference books ▸ Printed graphics or mobile application that shows signal flags ▸ Handout with signal flag task **Materials to support the demonstrations (step 3 & 4), such as:** ▸ Audio device to simulate sound communication (vessel horn). ▸ Lightbulbs/lamps of different colours ▸ Blinds/blankets to make the room dark ▸ Handouts or mobile application that visualises and explains the appearance or sound of the relevant signal.	Consider how the available materials and the classroom environment can be used to demonstrate the signs to the students, including day and night signs. For example, is it possible to make the classroom dark and ask the students to use flashlights on smart phones and work as a team to position themselves in a way to replicate different signs? **For Danish** – the mobile application '*sejlguide*' may be a useful tool for this activity. **For English/Spanish/French/German** - the mobile application '*Marinus Lite*' may be a useful tool for this activity. **SCAN THE QR CODE TO SEE AN EXAMPLE SIGNAL FLAG EXERCISE (In English & Danish)**	2,5h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
18	**Game based learning:** Competition with flip cards (buoys, day shapes, sounds signal and flags).	Applied knowledge and skill to recognise and understand the meaning of buoyage and day shapes. Applied knowledge and skill to recognise and understand sound signals and flags.	**Step 1** *(40 mins.):* Divide the students into teams of two (pairs). Ask the pairs to use the flip cards to work together as a team to learn the buoys, day shapes, sounds signal and flags. **Step 2** *(1 hr 40 mins.):* Ask the pairs to play against each other using their flip cards to test their opponent pair. After 5 minutes, ask the teams how many answers they got correct. Note the scores down on the whiteboard/flip-chart. Ask the teams to find a new opponent to play against and after 5 minutes count the correct answers again. Continue the process until all teams have played against each other. In plenary, ask the teams if they have a card that more than one of the groups got incorrect. If so, ask the group to present the card and the correct answer Count the correct answers and announce the winning team. **Step 3:** *(10 mins):* Discussion - Ask the students the following questions in groups or in plenary: 1. What is the difference between day and night buoys? 2. Can you describe the 4 manoeuvring sound signals? 3. Why is this knowledge useful? Consider putting groups of two and two together so that they in pairs discuss what they have learned.	▸ Flip cards displaying the buoys, day shapes, sounds signal and flags (widely available to purchase online for approximately 10€) ▸ Prize/award for the winning team ▸ Stopwatch/timer	Through game-based learning, in this activity the students will be engaged with using practical tools to further understand and test the knowledge gained in the previous activity. Each group will be given a selection of flip cards to test the other group in a competitive situation where the winner group could get an award. Help the students organise their groups and guide them regarding the rules of the activity.	2,5h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
19	**Direct Instruction:** Teacher led presentation about navigation and chartered lights.	Applied knowledge and skill to identify and understand the significance and meaning of navigation lights for various types of vessels. Applied knowledge and skill to identify and understand the various types of lights used by vessels to safely navigate in or out of port by night. Applied knowledge and skill to differentiate between two groups of lights (navigation lights and chartered lights)	**Step 1** *(40 mins.):* Brainstorm on what students can remember in relation to which lanterns ships have and what colours the lanterns have. Support the students where necessary to fill in any gaps in their recalled knowledge and encourage them to reflect upon the previous activities. Use the activity to summarise upon the learning so far. **Step 2** *(1 hour):* Follow up the brainstorm with a presentation to introduce difference between navigation lights, only on- board vessels and lights which appear only on buoys, lighthouses, ports, marinas, or hazards. **Step 3** *(40 mins.):* Using example charts, ask the students to locate, identify, and describe various chartered lights (colours, flash patterns, heights, etc) **Step 4** *(10 mins.):* De-brief - Ask the students the following questions in groups or in plenary: 1. What did you not know before about the subject? etc. 2. How is this knowledge useful? Consider putting groups of two and two together so that they in pairs discuss what they have learned.	▸ Projector and Laptop ▸ Video/photograph examples to show different navigation lights as seen by night ▸ Reference books ▸ Navigation chart showing a port or a marina to give examples of lights as seen on a chart. ▸ Flip cards to demonstrate the different navigation lights (widely available to purchase online for approximately 10€). **SCAN THE QR CODE TO SEE AN EXAMPLE POWERPOINT PRESENTATION WITH IMAGES OF NAVIGATION LIGHTS AND CHARTERED LIGHTS**	In this activity it is important to ensure that the students can recognise there are two types of lights which are important methods of communication: ▸ **Navigation lights** indicate to other vessels direction, type, activity, and size (another vessel in view). ▸ **Chartered lights** in ports or marinas are to communicate information regarding where to go and where not to go.	2,5h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
20	**Game based learning:** Navigation Lights - Consolidating the learning with flip cards, online simulators, and online activities.	Applied knowledge and skill to identify and understand the significance and meaning of navigation lights for various types of vessels. Applied knowledge and skill to identify and understand the various types of lights used by vessels to safely navigate in or out of port by night. Skills and attitude to work and make decisions in a team. Skills and attitude to make decisions individually. Strengthened IT skills.	**Step 1** *(1 hour):* Provide a computer/laptop/tablet for each student. Guide the students to individually work through the simulations and activities on ecolregs.com. The simulations will offer a variety of scenarios that will test and consolidate the students learning. Observe the students closely and support them as needed. **Step 2** *(15 mins.):* Facilitate a discussion amongst the students upon their experience in the simulations, ask them if there was anything they found difficult or hard and to elaborate why. **Step 3** *(1 hour):* Divide the students into teams of 2-4 and instruct the teams to pair up with another team to test their knowledge and skill in understanding of light signals using flip cards. Make it clear to the teams that they must find a consensus before answering. Rotate the groups in until all groups have played against each other. **Step 4** *(15 min):* Discussion - Ask the students the following questions in groups or in plenary: 1. What is the difference between navigation lights and chartered lights? 2. Can you name 4 characteristics that navigation lights will offer? (e.g. type of Vessel) 3. Can you give 4 examples of chartered lights. (e.g. colour, type of flash, frequency and distance.) Consider putting groups of two and two together so that they in pairs discuss what they have learned.	‣ Computers/laptops/tablets for each student with internet access (to access ecolregs.com or download mobile application 'sejlguide') ‣ Flip cards of light signals (widely available to purchase online for approximately 10€)	This activity is designed to consolidate and strengthen the learning from the previous activities and to develop skills and attitudes which are important to important to maritime work ethic (teamwork and decision making both collectively and individually). Prepare and test the online tool prior to the activity to help students work with the program. https://ecolregs.com/. The Ecolregs website is available in English and Spanish only. For Danish Language, an alternative tool is the mobile application 'sejlguide' Be mindful that some students may be unfamiliar with the use of IT tools and may need support with the basic functionality of the computer or tool used. Consider to reserve/book the school's computer lab for the activity.	2,5h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
21	**Experiential Learning:** Visit to a local port, marina, or lighthouse for recognition and comparison in a real sense	Applied knowledge and skill to recognise various marks, flags, and lights. Knowledge of the actual size and dimensions of various buoys, lights and flags.	Transport to the port/marina/lighthouse. **Step 1:** On route to location facilitate a discussion by asking the students the following: ▸ Do you know of any examples of lights (not navigation lights seen on ships)? **Step 2** *(30 mins):* Upon arrival conduct a safety briefing in cooperation with the port/marina/lighthouse master/manager. **Step 3** *(1 hour 30 mins.):* Using the surrounding environment, encourage the students to identify the various means of communication that have been explored in the previous activities. Support the students in their recollection of what the different marks, flags and lights mean. Use handouts to offer further support. Ask the students to walk around the area in pairs and photograph or draw the different marks, buoys, flags, and lights. Whilst the students are walking around, encourage them to observe any kind of action or situation that is not environmentally friendly, and ask them to collect any litter they find. **Step 4** *(30 mins):* Discussion - Ask the students the following questions in plenary: 1. How do you recognise a buoy or lighthouse by day? 2. How do you recognise a lighthouse or buoy by night? 3. What is the job of buoys? 4. What is the role of a lighthouse?	▸ Notepads & pens ▸ Cameras ▸ Handouts showing different marks, flags and lights **SCAN THE QR CODE TO SEE AN EXAMPLE HANDOUT (IN DANISH)** 	This activity should take place at a number of locations such as a local port, marina or lighthouse. Research and prepare various suitable locations to carry out the excursion. During the day, at least two suitable locations should be visited. The time indicated for 'step 2' assume that two different locations are visited during the day. The time used to travel between locations has also been considered in the suggested time. If more locations are visited, the times may be adjusted accordingly. The de-brief (step 3), should only be conducted once, regardless of the number of locations visited. Where possible, consider organising the day to allow for the possibility to see lights in an illuminated sense, for example, conduct the activity at 1:00PM through to 5:00PM to experience darkness. Consider transport, refreshments, lunch, authorizations regarding visiting the various locations. Be mindful of the dangers and risk associated with the port/marina environments during hours of darkness.	5h

NAVIGATION ON WATER
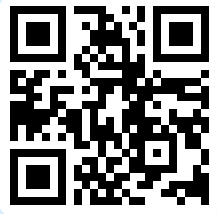
4 DAYS (20 HOURS) OF TEACHING/TRAINING, COVERING:

    A. **Introduction to Navigation**

    B. **The Chart**

    C. **The Chart Work / Passage Planning Practice**

    D. **Collision Regulations**

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
22	**Direct Instruction:** Teacher led presentation on the history of Navigation and the influence of the tide on navigation.	Basic knowledge of the fundamental differences of navigating in tidal or non-tidal waters.	**Step 1** *(15 mins.):* Start the activity by facilitating a brainstorm. Ask the students the following questions and note down the answers on a whiteboard/flipchart: ▸ What is navigation? ▸ What influences navigation? **Step 2** *(45 mins.):* Follow up the brainstorm with a presentation to introduce to the history and the reasons of navigation, through a slide presentation. Explain that a main consideration of navigation was the effects of the tide.	▸ Projector and Laptop ▸ Reference books ▸ Presentation **SCAN THE QR CODE TO SEE AN EXAMPLE PRESENTATION USED IN THE DANISH CLASSROOM**	Consider preparing a presentation using a tool such as prezi.com to graphically demonstrate the movement of the tide.	**1h**

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
23	**Project based learning:** Student research of online videos showing tidal rise and fall and tidal stream effects.	Knowledge and appreciation of the effects and dangers of tidal waters.	**Step 1** *(40 mins.):* Ask the students, independently or in pairs, to research YouTube videos that demonstrate the effects and movement of tidal heights and tidal streams. **Step 2** *(20 mins):* Select some of the videos found by the students and show them to all the students in plenary. Use the videos to facilitate a discussion amongst the students upon the dangers of tidal waters. **Step 3** *(30 mins):* Discussion - Ask the students the following questions in plenary: 1. What causes the tide? 2. Why do we need to calculate for the tide? 3. What are the risks to navigation if tide is not considered?	▸ Computers or mobile devices with internet access ▸ Projector and laptop	Consider identifying several suitable videos before the activity to use in the case that the students are unable to find videos which effective demonstrate the effects and dangers of tidal waters.	1,5h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
24	**Direct Instruction & project based learning:** Teacher led presentation and group assignment using nautical charts.	Applied knowledge of chart scale features and colour coding. Applied knowledge and skill in using the plotter, the dividers, and the compass. Knowledge of lake demarcations. Applied knowledge and skill to read a chart. Applied knowledge and skill to plan a simple passage. Recognition of the importance of precision in chartwork and the consequences of unprecise chartwork.	**Step 1** *(15 mins.)* - Start the activity by facilitating a brainstorm. Ask the students the following questions and note down the answers on a whiteboard/flipchart: ▸ What is a chart? ▸ What information does a chart show? **Step 2** *(45 mins.):* Follow up the brainstorm with a presentation to introduce the use and information given on a nautical chart (i.e. scale, north arrow, lines of longitude and latitude, bearing) Demonstrate the use of navigation tools such as the plotter, the divider, and the compass. Demonstrate the key points for safe passage planning. **Step 3** *(1 hr):* Divide the students in pairs and provide them with assignments that test them to demonstrate that they know what they need to know. **Step 4** *(30 mins.):* Discussion - Ask the students the following questions in groups or in plenary: 1. What is meant by the course? 2. How is distance measured on the chart? 3. Can you define depth of water. 4. What is the scale of the chart used in this activity? Consider putting groups of two and two together so that they in pairs discuss what they have learned.	▸ Plotter ▸ Dividers ▸ Pencils ▸ Notepads ▸ Calculators ▸ Compass ▸ Reference books ▸ Nautical charts **SCAN THE QR CODE FOR AN ELECTRONIC NAUTICAL CHART (OF SCANDINAVIA)** **SCAN THE QR CODE FOR AN EXAMPLE OF THE ASSIGNMENTS USED IN THE DANISH CLASSROOM**	Prepare assignments that the students can carry out (step 3). Ensure that the students have the supportive materials and equipment needed to carry out the assignments. Ensure sufficient charts for use within the activity (minimum one per two people). Ensure necessary training materials and equipment are available. Stress to the students that the equipment is delicate and expensive, and it should be used with care.	2,5h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
25	**A combination of hands-on learning and project-based learning:** Students work in groups, with teacher support, to create a passage plan.	Applied knowledge and skill to draw up a simple passage plan. Skill and attitude to work autonomously. Skill and attitude to work with others to solve problems and find solutions.	**Step 1: Morning session** *(2hrs 30 mins.):* Divide the students into groups of 2-3 and hand out the materials to the groups. Provide each group with an origin location and a destination point and explain to them that they should work together in their groups to prepare a passage plan taking into consideration: time of departure, time of arrival, weather, wind direction, tide direction, date, time of day, speed of boat, size of boat. Explain to the students that their plan should include: Plotting the course, determining the distance from start to finish, the bearing of the course, the time it will take to complete the passage and contingency plans for emergency situations. Encourage the groups to work together to find solutions. Support them where necessary. **Step 2: Afternoon session** *(2hrs 20 mins):* Allow the students some extra time to complete their passage plans if necessary. Then ask the groups to present their plans in plenary one-by-one. After each presentation offer feedback an input to the groups, ask them if they faced any difficulties in creating their plans and in working together. Ask them how they overcame the difficulties. **Step 3 Discussion** *(10 mins):* Ask the students the following questions in groups or in plenary: 1. Can you describe the art of navigation? 2. What is a contingency plan? 3. What type of vessel are you using in your plan? 4. How does the type of vessel (sail or power) affect the plan? Consider putting groups of two and two together so that they in pairs discuss what they have learned.	‣ Nautical chart ‣ Plotter ‣ Dividers ‣ Pencils ‣ Notepads ‣ Calculators ‣ Compass	This activity will be divided into two sessions. During the morning session, the students will work in groups to create a passage plan. In the afternoon session each group will present their completed passage plans to their fellow students. Bear in mind that the morning session will be devoted to the preparation of the plan and be prepared to help and assist the students during this process. Stress to the students that the equipment is delicate and expensive, and it should be used with care. During the afternoon presentations, assess how well each group understood and acknowledged the level of detail required	5h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
26	**Flipped classroom learning approach:** Students learn the collision regulations through self-study and then teach their peers.	Knowledge of which vessel gives way in different collision scenarios. Skill and attitude to autonomously research and source learning materials. Skills to communicate and present information in a structured and clear way.	**Step 1** *(45 mins.):* Use a variety of videos (for example from YouTube), to show examples of collision scenario's at sea. During the videos, highlight to the students the rules that have/ have not been followed. Use the videos to emphasize the students the importance of have a common set of collision rules when at sea. **Step 2** *(2hrs. 30 mins.):* Divide the students into groups and ask the groups to independently study the collision rules and make a presentation of the rules that they will present to the fellow students later in the day. Encourage the students to think creatively on how they will present the rules to their fellow students. **Step 3** *(1hr 30 mins.):* Ask each group to present the collision rules to their fellow students. After Each presentation, facilitate a dialogue where the students can offer feedback to the group who presented. After all groups have presented, summarise on the learning, and highlight any rules that the groups had interpreted differently, and offer any necessary clarifications. **Step 4:** *(15 min)* De-brief - Ask the students the following questions in groups or in plenary: 1. What did you know about collisions regulations before this activity? 2. Are these regulations international or local to each country? 3. Do you have any questions about the regulations?	▸ Computers with internet access ▸ Projector ▸ Reference books ▸ Collision report examples ▸ A variety of videos (for example from YouTube), to show examples of collision scenarios at sea. **SCAN THE QR CODE FOR EXAMPLE VIDEO** 	This activity will be divided into two sessions. In the morning session that will offer an introduction and reasons why the "colregs" (Collision regulations) exists and will include examples of collisions using video and collision report examples. For this part of the activity prepare a selection of YouTube videos that demonstrate both collision and risk of collision. This will be followed by the flipped learning classroom approach, where the students source a variety of learning materials to help them learn the specific collision regulation known as the give-way rules. In the later session, the students will present their work back to the class. Monitor how the students collect their learning materials and formulate their presentations. Give feedback to the students on their presentation and use their presentations to assess their learning and identify any gaps in their understanding.	5h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
27	**Game based learning:** Students work through online simulations of collision scenarios.	Knowledge of real-life collision situations. Skill and attitude to put knowledge into practice in collision situations. Skill and attitude to autonomously make decisions in collision scenarios. Strengthened digital skills.	**Step 1: Morning session** *(2hrs 30 mins.):* Instruct the students on how to access the NEO-COL training course and work through the different collision scenarios. Each scenario is an animated representation of a real-life collision situation. Each scenario offers a storyboard which provides step by step development during the last minutes before the collision. **Step 2** *(30 mins.):* facilitate a discussion amongst the students on their experience in navigating through the scenario's. Encourage them to share with each other the challenges they faced and how it felt to make decisions. **Step 3: Afternoon session** *(2hrs 20 mins):* Ask the students to work through the NEO-COL assessment test to receive feedback regarding their performance. **Step 4: Discussion** *(10 mins):* Ask the students the following questions in groups or in plenary: 1. How to determine if a risk of collision exists? 2. When is it appropriate to take action to avoid a collision? 3. Why in your opinion do collisions occur? Consider putting groups of two and two together so that they in pairs discuss what they have learned.	‣ Computers/laptops/tablets (with internet access) - for each student	This activity is divided into two sessions. In the morning session the students will learn independently through simulations. In the afternoon session the students will be tested on their learning. The activity uses the online use the NEO-COL simulator for learning and testing: https://neo-col.eu/training-course-1/ Pre-test the NEO-COL training course and its functionality and offer technical support to the students throughout the two sessions during the day. Consider to reserve/book the school's computer lab for the activity.	**5h**

SAFETY ON WATER

2 DAYS (10 HOURS) OF TEACHING/TRAINING, COVERING:

A. **Understanding Safety on Water**

B. **Handling Different Situations**

C. **Emergency Situations**

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
28	**Direct Instruction:** Teacher led introduction presentation of safety at sea.	Appreciation of the importance in knowing and being able to use essential safety equipment. Basic knowledge of which safety equipment is used in which emergency situation.	**Step 1** *(10 mins.):* Start the activity by facilitating a brainstorm. Ask the students the following questions and note down the answers on a whiteboard/flipchart: ‣ What is safety at sea? ‣ What security elements are there? **Step 2** *(15 mins.):* Follow up the brainstorm with a brief presentation to introduce the concept of safety in the maritime field. Break the presentation down into three separate subjects: safety equipment, safety rules and medical first aid. **Step 3** *(5 mins.):* Give a briefing of the day ahead which will include an out-sourced invited professional instructor to deliver specific content regarding safety equipment and medical first aid procedures.	**Materials to support the presentation (step2), such as:** ‣ Safety equipment ‣ Videos ‣ Handouts	Use the activity to briefly introduce the concept of safety in the maritime field. Prepare prior to the class the relevant safety equipment to be demonstrate to the students. Liaise with the instructor to coordinate the day for this teaching element. Be aware of the misuse and dangers of certain safety equipment i.e. Flares, these must be dummy examples.	0,5h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
29	**Direct Instruction:** Session with a professional instructor to demonstrate and teach the important basics of medical first aid.	Knowledge of basic medical first aid, including the recognition and procedure to deal with hypothermia, frostbite, and undercooling. Knowledge of treatment and care options. Skill and attitude for decision making and teamwork.	**Step 1:** Introduce the professional instructor to the students. **Step 2** *(2 hours.):* Give the floor to the professional instructor. Be available to offer support where needed. The professional instructor should demonstrate the use of Dummy safety equipment i.e. Fire extinguishers and distress flares and present a range of other essential safety equipment to be carried onboard. The Instructor will also deliver the Basic First Aid training to the students including the recognition and procedure to deal with hypothermia, frostbite and undercooling.	▸ Medical first aid kit ▸ Dummy fire extinguishers and flares. ▸ Life jackets	Liaise with the professional instructor regarding the plan and content for the teaching session. During the professional instructor presentations, use the opportunity to observe and evaluate the students understanding, attitude and progress.	2h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
30	**Hands-on learning:** Practical demonstration and testing among students of various essential safety equipment.	Skill and knowledge to use and demonstrate essential safety equipment Knowledge of the procedures for basic medical first aid. Knowledge of the contents of the basic medical first aid kid. Strengthened teamwork Strengthened sense for responsibility amongst the students.	**Step 1** *(45 mins):* Divide the students into groups. Explain to the students that a number of 'skill stations' have been set up, and that each station has a scenario and instruction sheet. *Skill station example: Your colleague has cut his arm and is bleeding. You need to apply a pressure bandage.* Send each group to a skill station and ask them to work together to solve the task on the instruction sheet using the equipment available **Step 2** *(45 mins):* Ask each group to present their scenario to the other groups and demonstrate how they solved the situation in their scenario. **Step 3** *(45 mins):* send each group to a new station. One member of each team will go to the station they were previously at, and remind the other group of the scenario, and inspect if they can solve the scenario without the instruction sheet, supporting them where needed. **Step 4** *(15 mins):* Discussion - Ask the students the following questions in groups or in plenary: 1. Why is safety so important in a vessel? 2. In what situation will you call for medical assistance? 3. A crew member has been knocked unconscious, what should you do? Consider putting groups of two and two together so that they in pairs discuss what they have learned.	▸ Safety equipment ▸ Medical first aid kit. ▸ First aid mannequin ▸ Print outs of scenario instruction sheets for each station **SCAN THE QR CODE FOR EXAMPLE SCENARIO INSTRUCTION SHEETS FOR 4 STATIONS.** 	Prior to the activity, set up a number of stations with different safety equipment. Observe and evaluate the students understanding and participation during the groupwork. Consider using an online tool such as Kahoot.com to prepare a simple quiz to test the students learning at the end of the activity.	2,5h

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
31	**Direct Instruction:** Teacher led presentation, in cooperation with a professional safety officer, to introduce and provide examples on how to deal with emergency situations.	Knowledge of the dangers and causes of emergency situations. Knowledge of the procedures to deal with emergency situations.	**Step 1** *(15 mins.)*: Start the activity by facilitating a brainstorm. Ask the students the following questions and note down the answers on a whiteboard/flipchart: ▸ What emergencies can one come across at sea/on water? ▸ What danger is there in connection with those emergencies? **Step 2** *(1 hr 15 mins.):* Follow up the brainstorm with a presentation to introduce man overboard, fire on board, sinking, run around. Conduct the presentation in cooperation with a professional safety officer who should deliver the vital teaching for the subject. **Note:** Fire, sinking and running aground can be explained through video examples and not through practical experience. Stress to the students that only the man overboard situation will be experienced in the afternoon session at the local swimming pool.	▸ Flip cards to demonstrate precautions to prevent emergency situations. ▸ Video examples of emergency situations. **SCAN THE QR CODES FOR EXAMPLE VIDEOS**	This session will be carried out during the morning and will include videos and presentations regarding the following emergency situations. Coordinate together with the professional safety officer the full day which will include the practical session at the local swimming pool in the afternoon.	1,5h

| ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
32	**Experiential learning:** Visit to local pool to experience sea survival and rescue training.	Applied knowledge and skill to take part in a sea survival emergency rescue situation. Appreciation of the risks and importance of behaviour onboard a vessel. Strengthened sense of responsibility towards themselves and others.	Transport to the swimming pool **Step 1:** Led by the professional safety officer, the students should learn and practice the sea survival techniques and use of life raft skills. **Step 2** *(30 mins.):* Discussion - Ask the students the following questions in groups or in plenary: 1. How is the size of a life raft determined? 2. What is meant by newton buoyancy? 3. What risks exist after launching the life raft? 4. Can you name 3 pieces of equipment to deal with a fire on board? 5. What safety equipment is essential to use if the ship is sinking? Consider putting groups of two and two together so that they in pairs discuss what they have learned.	▶ Safety equipment: provided by the pool/sea survival centre.	This practical activity should take place at a local swimming pool. Consider that only students that can swim are eligible to take part in this practical session. Consider transport arrangements, refreshments, and authorizations. Pre-organize together with the professional safety officer the venue and equipment required for this afternoon session. The professional safety officer should accompany the students to the study visit to help organise and coordinate the day ahead.	3,5h

ECOLOGY

**1 DAY (5 HOURS) OF TEACHING/TRAINING, COVERING:**

A. **Ecological Environment Related to Water and the Effects of Maritime Activity on the Environment**

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS /EQUIPMENT	NOTES FOR TEACHERS	TIME
33	**Direct Instruction:** Teacher led presentation to introduce the ecological environment related to water, and the ecological effects of maritime activities.	Basic knowledge and appreciation of the impact of pollution on the sea and land-based environment. Basic knowledge of how maritime activity can affect the environment: Dangerous chemicals onboard, organic waste, litter, noise, anchoring, pollution. Appreciation of the importance of the coastal environment and how it can be protected.	**Step 1** *(15 mins.):* Start the activity by facilitating a brainstorm. Ask the students the following questions and note down the answers on a whiteboard/flipchart: ▸ How do we pollute and damage our lakes, fjords, and seas? ▸ Why do we do this? ▸ What will our own area look like in 50 years if we do nothing about it? **Step 2** *(45 mins.):* Follow up the brainstorm with a presentation to introduce to the students the impact of pollution and the damaging effects regarding the sea and land-based environment. Use videos and presentations to deliver the following content: Dangerous chemicals onboard, organic waste, litter, noise boating activity/anchoring, sea life, seaweed, pollution, plastic pollution. Conclude the presentation with a brief introduction to the UN Sustainable Development goal 14 – Life Below water. **Step 3 (15 min):** De-brief: Facilitate a discussion and further reflection amongst the students on the impact of pollution on the marine environment.	**Materials to support the presentation (step 2), such as:** ▸ Slide presentations ▸ Videos **SCAN THE QR CODES FOR EXAMPLE VIDEOS (in Danish)**	Prepare a selection of videos to demonstrate the contents and the effects on the environment regarding each aspect.	**1h**

ACTIVITY ID	METHOD & ACTIVITY DESCRIPTION	LEARNING OBJECTIVES	INSTRUCTION	MATERIALS/ EQUIPMENT	NOTES FOR TEACHERS	TIME
34	**Project-based learning:** Student led project to undertake research and build a campaign to promote a beach clean-up.	Knowledge and awareness of the importance of the coastal environmental and how to protect it. Strengthened teamwork and organisational skills. Sense of responsibility for advocating for and acting upon environmental protection and environmental responsibility in the maritime sector.	**Step 1** *(15 mins.):* facilitate a brainstorm and discussion amongst the students to identify and agree upon a local area where there is a need for a clean-up (lakes, ports, beaches, etc.). **Step 2** *(3hrs. 30 mins.):* Present to the students the task planning a campaign to raise awareness of the importance of environmental protection and to encourage residents to engage in actions to help with a clean-up. Set several minimum requirements that the students should include in their campaign for example: a campaign name and logo, social media posts, posters, QR codes to offer information to local residents. Encourage the students to think about how they will organise themselves to complete the task. Support the students where needed. You may wish to include other stakeholders (other schools, the local municipality) or other school departments (graphic design class) **Step 3** *(15 mins.):* Discussion - Ask the students the following questions in plenary: 1. What can we as individuals do to not pollute the environment? 2. If an accident has happened and you have polluted, for example, spilled oil in the port - what do you do then? 3. What can you use this new knowledge/ skill/awareness/sense of responsibility for? How can you use it?	‣ Reference books, ‣ Mobile phones ‣ Computers ‣ Posters ‣ Prize	In this activity, the students will work together to develop their own campaign to raise awareness of the importance of environmental protection, and to encourage people to act. You may consider to follow-up on the initial planning activity and dedicate time whereby the students can implement their campaign and engage in local clean-up actions. Consider that it may be necessary to contact local authorities to seek permission for the event. Introduce and guide students regarding the campaign objectives and offer tips and advice before hand. Consider the need for authorization from parents, for example regarding the use of mobile phones. Consider offering a prize and a certificate of local heroes to the class for delivering a successful project.	4h
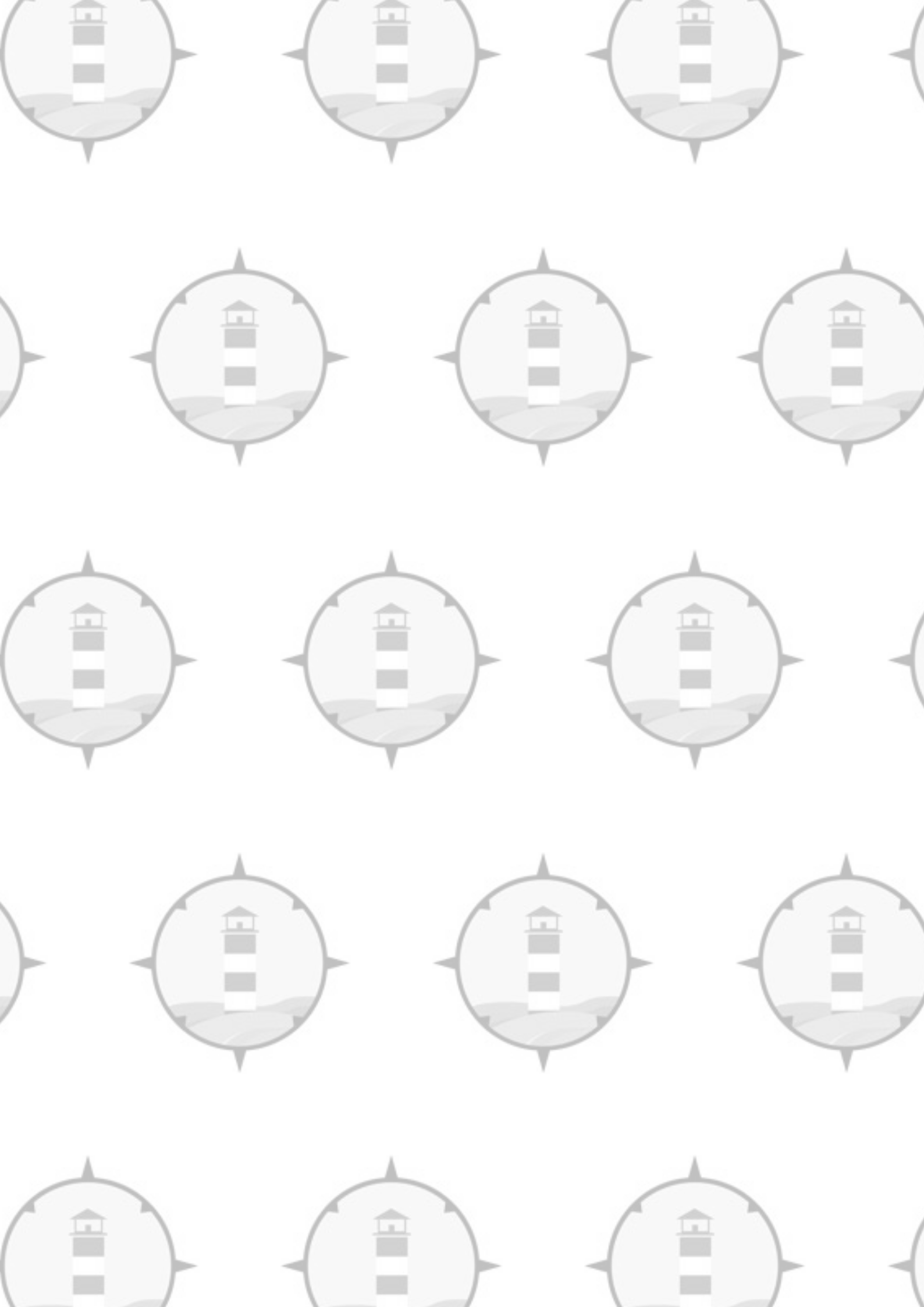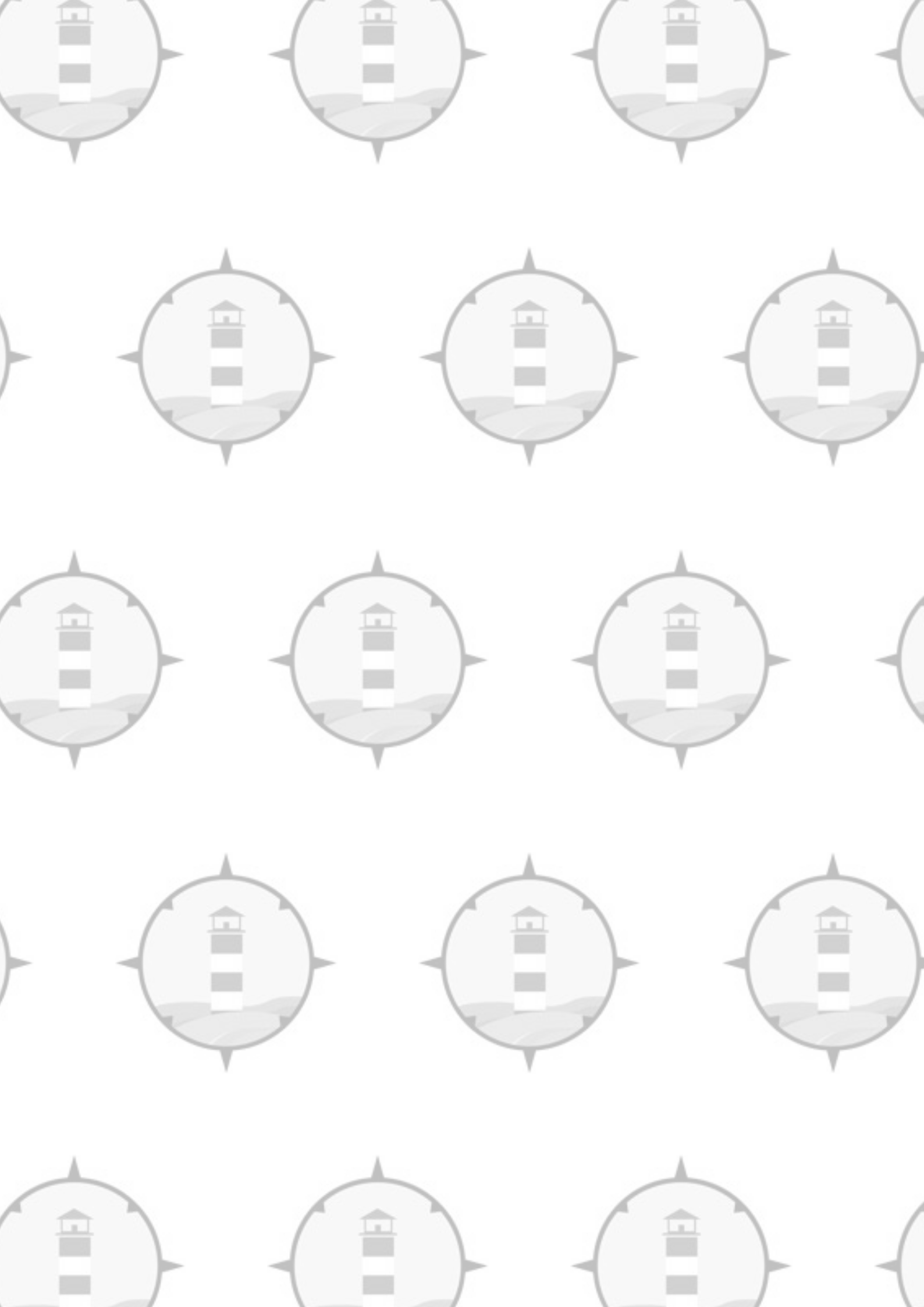
THE EDUCATIONAL OBJECTIVE

To provide basic, yet holistic Maritime competence to students enrolled on various vocational education and training (VET) programmes. Thus, providing learners with a basic maritime literacy that can be taken forward into any further education or work that is related or connected to seas, oceans, coasts, and inland waterways.