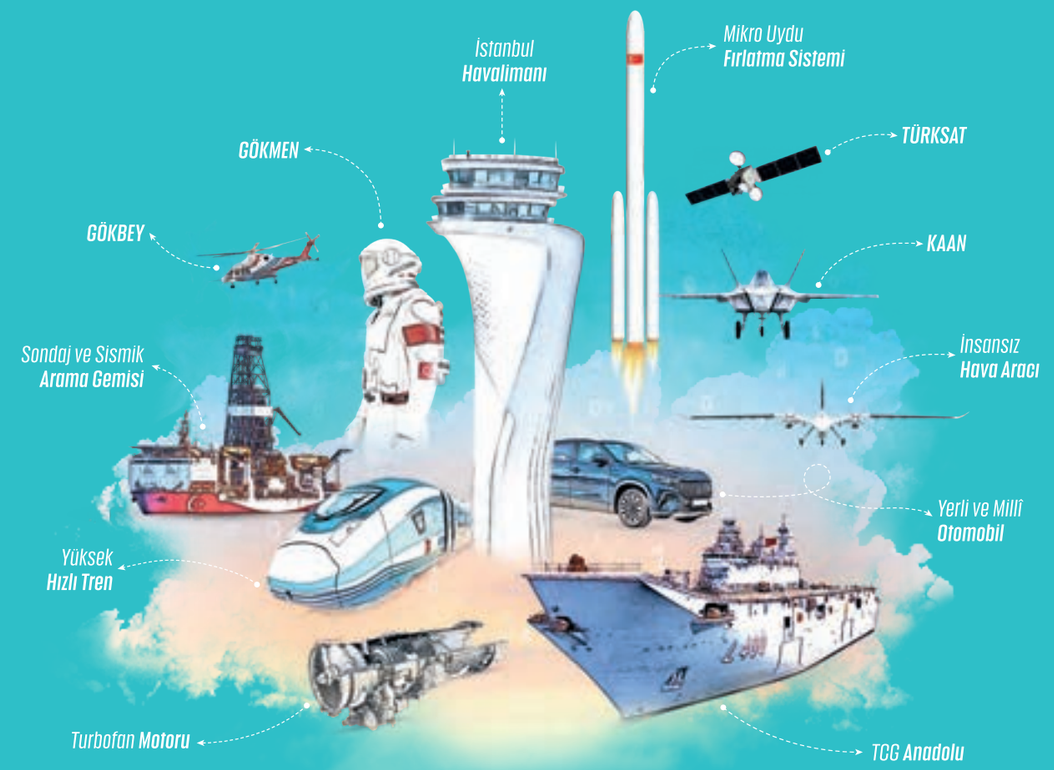
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VOCATIONAL AND TECHNICAL ANATOLIAN HIGH SCHOOL

MARITIME

VOCATIONAL FOREIGN LANGUAGE (MARITIME)



10 COURSE MATERIAL

VOCATIONAL AND TECHNICAL ANATOLIAN HIGH SCHOOL

VOCATIONAL FOREIGN LANGUAGE (MARITIME)

10 COURSE MATERIAL

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İSTİKLÂL MARŞI

Korkma, sönmez bu şafaklarda yüzen al sancak;
Sönmeden yurdumun üstünde tüten en son ocak.
O benim milletimin yıldızıdır, parlayacak;
O benimdir, o benim milletimindir ancak.

Çatma, kurban olayım, çehreni ey nazlı hilâl!
Kahraman ırkıma bir gül! Ne bu şiddet, bu celâl?
Sana olmaz dökülen kanlarımız sonra helâl.
Hakkıdır Hakk'a tapan milletimin istiklâl.

Ben ezelden beridir hür yaşadım, hür yaşarım.
Hangi çılgın bana zincir vuracakmış? Şaşarım!
Kükremiş sel gibiyim, bendimi çiğner, aşarım.
Yırtarım dağları, enginlere sığmam, taşarım.

Garbın âfâkını sarmışsa çelik zırhlı duvar,
Benim iman dolu göğsüm gibi serhaddim var.
Ulusun, korkma! Nasıl böyle bir imanı boğar,
Medeniyyet dediğin tek dişi kalmış canavar?

Arkadaş, yurduma alçakları uğratma sakın;
Siper et gövdeni, dursun bu hayâsızca akın.
Doğacaktır sana va'dettiği günler Hakk'ın;
Kim bilir, belki yarın, belki yarından da yakın.

Bastığın yerleri toprak diyerek geçme, tanı:
Düşün altındaki binlerce kefensiz yatanı.
Sen şehit oğlusun, incitme, yazıktır, atanı:
Verme, dünyaları alsan da bu cennet vatanı.

Kim bu cennet vatanın uğruna olmaz ki feda?
Şüheda fışkıracak toprağı sıksan, şüheda!
Cânı, cânânı, bütün varımı alsın da Huda,
Etmesin tek vatanımdan beni dünyada cüda.

Ruhumun senden İlâhî, şudur ancak emeli:
Değmesin mabedimin göğsüne nâmahrem eli.
Bu ezanlar -ki şehadetleri dinin temeli-
Ebedî yurdumun üstünde benim inlemeli.

O zaman vecd ile bin secde eder -varsa- taşım,
Her cerîhamdan İlâhî, boşanıp kanlı yaşım,
Fışkırır ruh-ı mücerret gibi yerden na'şım;
O zaman yükselerek arşa değer belki başım.

Dalgalan sen de şafaklar gibi ey şanlı hilâl!
Olsun artık dökülen kanlarımın hepsi helâl.
Ebediyyen sana yok, ırkıma yok izmihlâl;
Hakkıdır hür yaşamış bayrağımın hürriyyet;
Hakkıdır Hakk'a tapan milletimin istiklâl!

Mehmet Âkif Ersoy

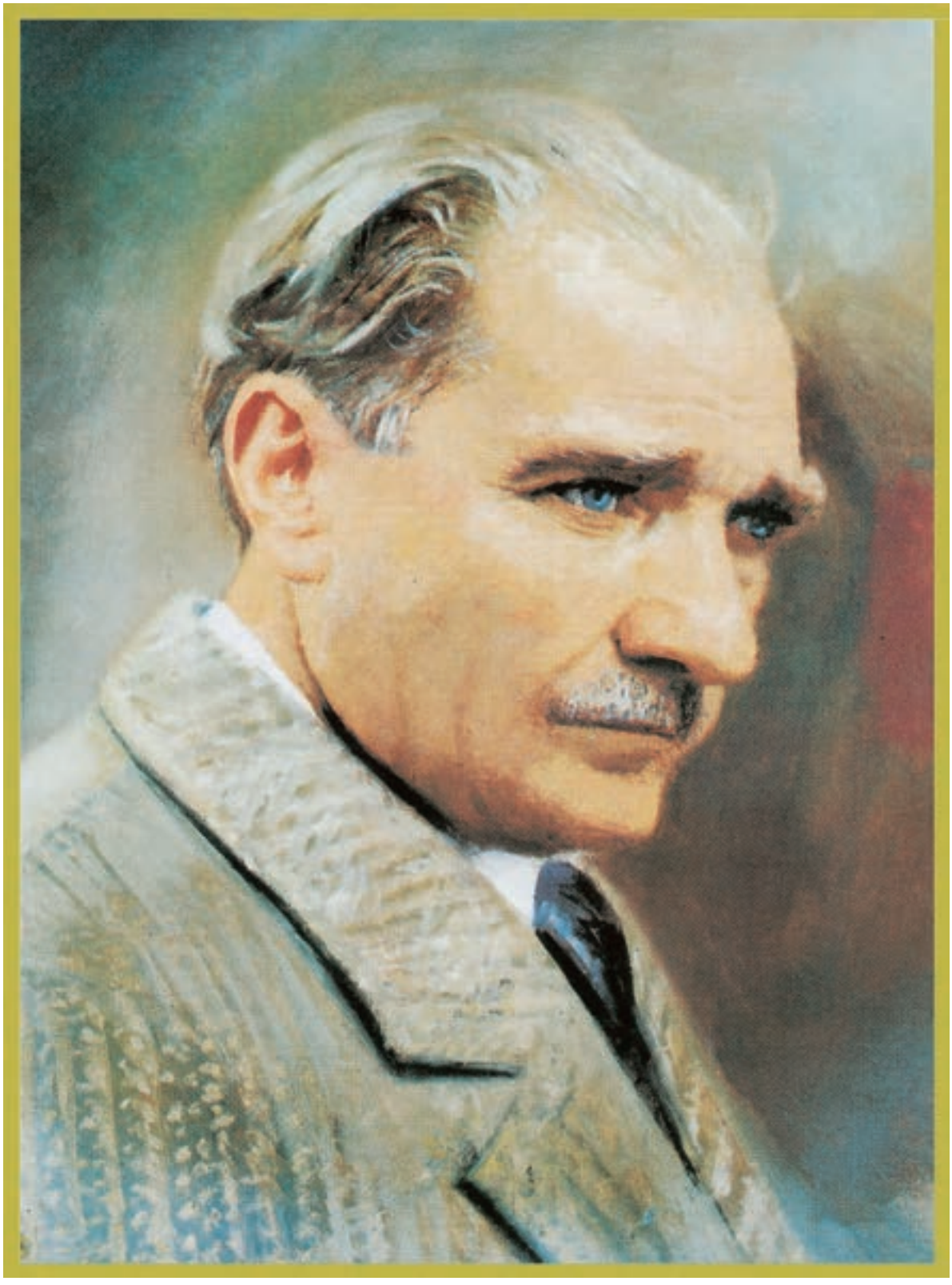
GENÇLİĞE HİTABE

Ey Türk gençliği! Birinci vazifen, Türk istiklâlini, Türk Cumhuriyetini, ilelebet muhafaza ve müdafaa etmektir.

Mevcudiyetinin ve istikbalinin yegâne temeli budur. Bu temel, senin en kıymetli hazinendir. İstikbalde dahi, seni bu hazineden mahrum etmek isteyecek dâhilî ve hâricî bedhahların olacaktır. Bir gün, istiklâl ve cumhuriyeti müdafaa mecburiyetine düşersen, vazifeye atılmak için, içinde bulunacağın vaziyetin imkân ve şeraitini düşünmeyeceksin! Bu imkân ve şerait, çok namüsait bir mahiyette tezahür edebilir. İstiklâl ve cumhuriyetine kastedecek düşmanlar, bütün dünyada emsali görülmemiş bir galibiyetin mümessili olabilirler. Cebren ve hile ile aziz vatanın bütün kaleleri zapt edilmiş, bütün tersanelerine girilmiş, bütün orduları dağıtılmış ve memleketin her köşesi bilfiil işgal edilmiş olabilir. Bütün bu şeraitten daha elîm ve daha vahim olmak üzere, memleketin dâhilinde iktidara sahip olanlar gaflet ve dalâlet ve hattâ hıyanet içinde bulunabilirler. Hattâ bu iktidar sahipleri şahsî menfaatlerini, müstevlîlerin siyasî emelleriyle tevhit edebilirler. Millet, fakr u zaruret içinde harap ve bîtap düşmüş olabilir.

Ey Türk istikbalinin evlâdı! İşte, bu ahval ve şerait içinde dahi vazifen, Türk istiklâl ve cumhuriyetini kurtarmaktır. Muhtaç olduğun kudret, damarlarındaki asil kanda mevcuttur.

Mustafa Kemal Atatürk



MUSTAFA KEMAL ATATÜRK

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The graduates of maritime vocational high schools are most likely to work on ships which navigate international waters, within a multi-cultural crew. Therefore, learning and speaking a foreign language well, and being familiar with cross-cultural communication is a must for the students of these school.

This course material will familiarise you with the terms about…

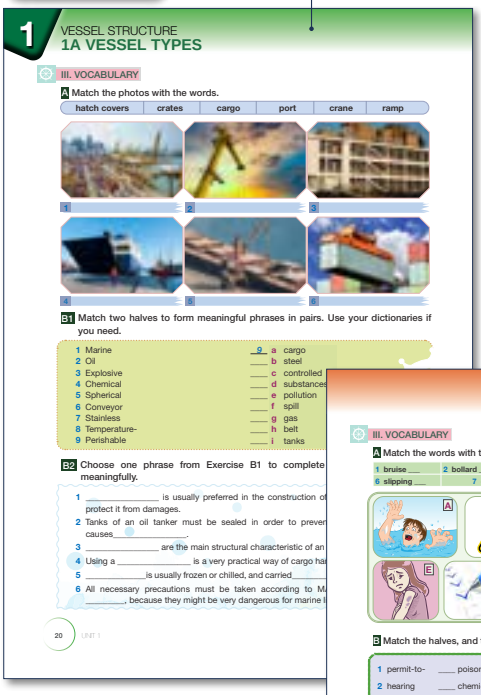
vessels

crew organisation

safety and emergency

maritime law and management

maritime engineering


1 VESSEL STRUCTURE
1A VESSEL TYPES

III. VOCABULARY

A Match the photos with the words.

hatch covers | crates | cargo | port | crane | ramp

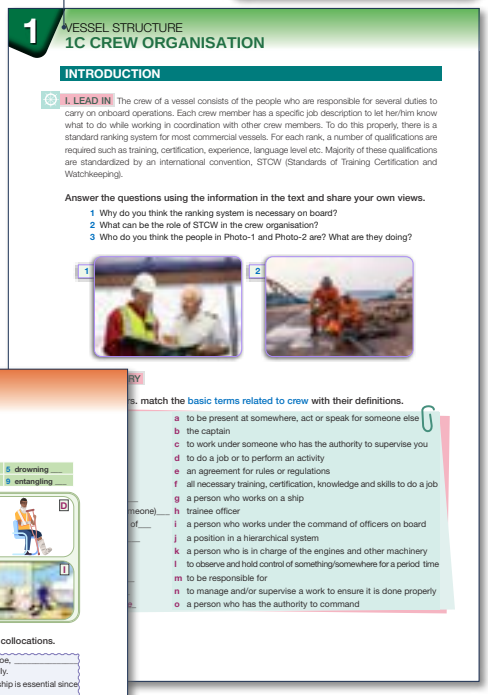
B1 Match two halves to form meaningful phrases in pairs. Use your dictionaries if you need.

1 Marine	_9_	a	cargo
2 Oil	___	b	steel
3 Explosive	___	c	controlled
4 Chemical	___	d	substances
5 Spherical	___	e	pollution
6 Conveyor	___	f	spill
7 Stainless	___	g	gas
8 Temperature-	___	h	belt
9 Perishable	___	i	tanks

B2 Choose one phrase from Exercise B1 to complete meaningfully.

1 _____ is usually preferred in the construction of protect it from damages.
2 Tanks of an oil tanker must be sealed in order to prever causes_____.
3 _____ are the main structural characteristic of an
4 Using a _____ is a very practical way of cargo ha
5 _____ is usually frozen or chilled, and carried_____.
6 All necessary precautions must be taken according to M _____, because they might be very dangerous for marine l

20 UNIT 1


1 VESSEL STRUCTURE
1C CREW ORGANISATION

INTRODUCTION

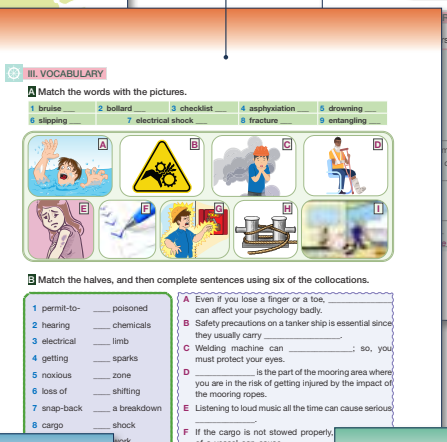
I. LEAD IN The crew of a vessel consists of the people who are responsible for several duties to carry on onboard operations. Each crew member has a specific job description to let her/him know what to do while working in coordination with other crew members. To do this properly, there is a standard ranking system for most commercial vessels. For each rank, a number of qualifications are required such as training, certification, experience, language level etc. Majority of these qualifications are standardized by an international convention, STCW (Standards of Training Certification and Watchkeeping).

Answer the questions using the information in the text and share your own views.

1 Why do you think the ranking system is necessary on board?
2 What can be the role of STCW in the crew organisation?
3 Who do you think the people in Photo-1 and Photo-2 are? What are they doing?

s. match the basic terms related to crew with their definitions.

	a	to be present at somewhere, act or speak for someone else
	b	the captain
	c	to work under someone who has the authority to supervise you
	d	to do a job or to perform an activity
	e	an agreement for rules or regulations
	f	all necessary training, certification, knowledge and skills to do a job
	g	a person who works on a ship
meone)___	h	trainee officer
of___	i	a person who works under the command of officers on board
	j	a position in a hierarchical system
	k	a person who is in charge of the engines and other machinery
	l	to observe and hold control of something/somewhere for a period time
	m	to be responsible for
	n	to manage and/or supervise a work to ensure it is done properly
	o	a person who has the authority to command


III. VOCABULARY

A Match the words with the pictures.

1 bruise ___ | 2 bollard ___ | 3 checklist ___ | 4 asphyxiation ___ | 5 drowning ___
6 slipping ___ | 7 electrical shock ___ | 8 fracture ___ | 9 entangling ___

B Match the halves, and then complete sentences using six of the collocations.

1 permit-to-	___	poisoned	
2 hearing	___	chemicals	
3 electrical	___	limb	
4 getting	___	sparks	
5 noxious	___	zone	
6 loss of	___	shifting	
7 snap-back	___	a breakdown	
8 cargo	___	shock	
		work	
		disorders	

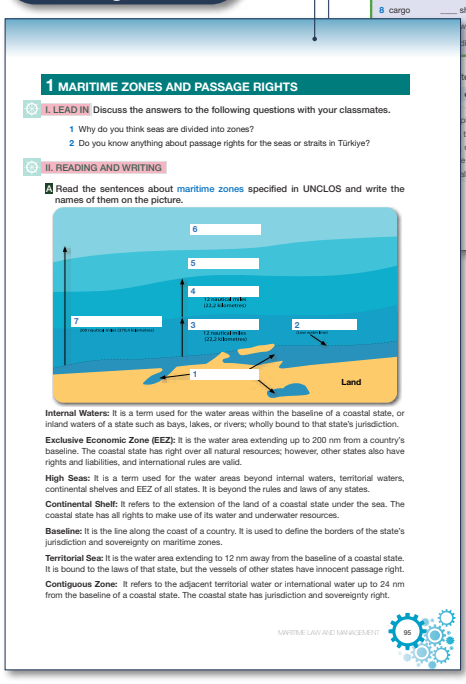
A Even if you lose a finger or a toe, can affect your psychology badly.
B Safety precautions on a tanker ship is essential since they usually carry _____.
C Welding machine can _____; so, you must protect your eyes.
D _____ is the part of the mooring area where you are in the risk of getting injured by the impact of the mooring ropes.
E Listening to loud music all the time can cause serious _____.
F If the cargo is not stowed properly, of a vessel can cause _____ dangerous since moving load can and damage the vessel, as well.

tences with given words.

confined | safety | sharp | falling

phobia; so I can't work in _____ spaces.
tools must be kept out of reach of children since they may c
objects can cause head injuries. Wear your helmet!
e floor is wet and _____. I have just washed it.
ll necessary _____ measures before starting the w

MARITIME SAFETY AND EME


1 MARITIME ZONES AND PASSAGE RIGHTS

I. LEAD IN Discuss the answers to the following questions with your classmates.

1 Why do you think seas are divided into zones?
2 Do you know anything about passage rights for the seas or straits in Türkiye?

II. READING AND WRITING

A Read the sentences about maritime zones specified in UNCLOS and write the names of them on the picture.

6
5
4 12 nautical miles (22,2 kilometres)
7
3 12 nautical miles (22,2 kilometres)
2
1
Land

Internal Waters: It is a term used for the water areas within the baseline of a coastal state, or inland waters of a state such as bays, lakes, or rivers; wholly bound to that state's jurisdiction.

Exclusive Economic Zone (EEZ): It is the water area extending up to 200 nm from a country's baseline. The coastal state has right over all natural resources; however, other states also have rights and liabilities, and international rules are valid.

High Seas: It is a term used for the water areas beyond internal waters, territorial waters, continental shelves and EEZ of all states. It is beyond the rules and laws of any states.

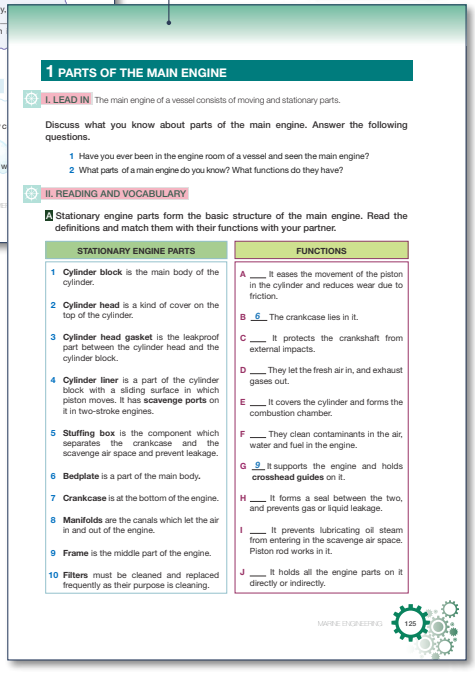
Continental Shelf: It refers to the extension of the land of a coastal state under the sea. The coastal state has all rights to make use of its water and underwater resources.

Baseline: It is the line along the coast of a country. It is used to define the borders of the state's jurisdiction and sovereignty on maritime zones.

Territorial Sea: It is the water area extending to 12 nm away from the baseline of a coastal state. It is bound to the laws of that state, but the vessels of other states have innocent passage right.

Contiguous Zone: It refers to the adjacent territorial water or international water up to 24 nm from the baseline of a coastal state. The coastal state has jurisdiction and sovereignty right.

MARITIME LAW AND MANAGEMENT 95


1 PARTS OF THE MAIN ENGINE

I. LEAD IN The main engine of a vessel consists of moving and stationary parts.

Discuss what you know about parts of the main engine. Answer the following questions.

1 Have you ever been in the engine room of a vessel and seen the main engine?
2 What parts of a main engine do you know? What functions do they have?

II. READING AND VOCABULARY

A Stationary engine parts form the basic structure of the main engine. Read the definitions and match them with their functions with your partner.

STATIONARY ENGINE PARTS		FUNCTIONS
1 **Cylinder block** is the main body of the cylinder.	A	___ It eases the movement of the piston in the cylinder and reduces wear due to friction.
2 **Cylinder head** is a kind of cover on the top of the cylinder.	B	_6_ The crankcase lies in it.
3 **Cylinder head gasket** is the leakproof part between the cylinder head and the cylinder block.	C	___ It protects the crankshaft from external impacts.
4 **Cylinder liner** is a part of the cylinder block with a sliding surface in which piston moves. It has **scavenge ports** on it in two-stroke engines.	D	___ They let the fresh air in, and exhaust gases out.
5 **Stuffing box** is the component which separates the crankcase and the scavenge air space and prevent leakage.	E	___ It covers the cylinder and forms the combustion chamber.
6 **Bedplate** is a part of the main body.	F	___ They clean contaminants in the air, water and fuel in the engine.
7 **Crankcase** is at the bottom of the engine.	G	_9_ It supports the engine and holds **crosshead guides** on it.
8 **Manifolds** are the canals which let the air in and out of the engine.	H	___ It forms a seal between the two, and prevents gas or liquid leakage.
9 **Frame** is the middle part of the engine.	I	___ It prevents lubricating oil steam from entering in the scavenge air space. Piston rod works in it.
10 **Filters** must be cleaned and replaced frequently as their purpose is cleaning.	J	___ It holds all the engine parts on it directly or indirectly.

MARINE ENGINEERING 125

This course material will familiarise you with the terms about…

Standard Marine Communication Phrases (SMCP)

seamanship

nautical charts and publications

meteorology

marine electronics

III. SPEAKING AND WRITING

CODES AND SPELLING

A Alphabetical and numeric code charts are used to exchange information in marine communication. Study the charts, notice that the underlined syllables are stressed and practice saying them.

LETTER	CODE	LETTER	CODE
A	Alfa	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor
J	Juliet	W	Whisky
K	Kilo	X	X-ray
L	Lima	Y	Yankee
M	Mike	Z	Zulu

FIGURE	CODE WORD	PRONUNCIATION
0	Zero	ZEERO
1	One	WUN
2	Two	TOO
3	Three	TREE
4	Four	FOWER
5	Five	FIFE
6	Six	SIX
7	Seven	SEVEN
8	Eight	AIT
9	Nine	NINER
1000	Thousand	TOUSAND

B Look at the example reporting a vessel's identification information and practice identifying the vessels below.

ANDROMEDA 816947200 2DZA

This is eight-one-six-nine-four-seven-two
Motor vessel "ANDROMEDA" Alfa Novem
Oscar Mike Echo Delta Alfa
Call sign Two Delta Zulu Alfa

1 STREAMLINE 300784200 9HZS

2 BARBAROS 425068900 TAZB1

3

C Write down the identifications of the vessels in Exercise A in f communication.

1

2

3

STANDARD MARINE COMM

III. VOCABULARY

A Match the halves to form meaningful phrases.

1 Weather ___	a initiative
2 Operate ___	b moving parts
3 Take ___	c a position
4 Lubricate ___	d a vessel
5 Plot ___	e forecast

B Fill in the gaps with the phrases in Exercise A.

1 _____ is frequently checked and reported during navigation since it is essential for a safe voyage.
2 Officers are working on a nautical chart to _____.
3 During maintenance, a special kind of oil is used to _____.
4 If you want to be a manager, you must learn how to _____ in unexpected situations.
5 You need to gain a lot of qualifications and experiences in order to _____.

IV. SPEAKING AND WRITING

A1 Work in groups and discuss what people are doing in the photos in Exercise A2

e see a crew member holding a pen and a chart divider in his hands. He is chart.

tions under the correct photos as in the example.

	mooring	repairing a ladder
g parts		plotting a position on a chart

on a chart 2 3 5

SEAMANSHIP 169

B Match the pictures with the words.

1 Wreck ___
2 Scale ___
3 Aids to navigation ___
4 Current ___
5 Tide ___

A B C D E

IV. SPEAKING Work in groups and discuss what you can see in the nautical chart below.

e.g., I can see the chart's title on the right-bottom corner of the chart.

6 SEAMANSHIP
6C METEOROLOGY

1 METEOROLOGICAL INSTRUMENTS

I. LEAD IN Meteorological instruments are devices measuring the values of atmospheric pressure, humidity, and speed of wind in the air.

Discuss the answers to the following questions in class.

1 Do you know any meteorological instruments?
2 Is there a meteorological instrument that you use in everyday life? What do you use it for?

II. READING AND VOCABULARY

A Write the names of the meteorological instruments to complete the paragraphs, and then match them with their pictures.

___ Anemometer ___ Thermometer ___ Psychrometer ___ Barometer

A B C D

1 _____ measures the air temperature by degrees. It can be found at various locations in the accommodation on the vessel.

2 _____ consists of two thermometers: dry bulb and wet bulb. Both measure temperature and humidity; and the difference between the values of the two thermometers is calculated and compared. It is kept in protection boxes on the bridge wings.

3 _____ measures the atmospheric pressure. Aneroid type is used in ships. It is located on the bridge wings.

4 _____ measures the speed and direction of the winds. The one measuring the direction of the wind is called 'juriet'. It is located on the main mast.

B Write the correct measurement unit for each measurement. Choose the units from the box.

Millibar (mb) Percentage (%) N, NNE, NE Degree Celsius (°C) Millimetre (mm) Nautical mile (nm)

MEASUREMENTS/READINGS	UNITS
1 Wind direction	
2 Temperature	
3 Visibility	
4 Humidity	
5 Rainfall	
6 Pressure	

198 UNIT 6

7 MARINE ELECTRICS AND ELECTRONICS
7C ELECTRIC INSTALLATION AND ELECTRONIC CIRCUIT COMPONENTS

I. LEAD IN Electrical installation materials used on ships should be durable and safe. Explosion-proof materials should be used in the environments containing explosive and flammable substances; and waterproof installation elements should be preferred in humid environments.

Discuss the following questions with your classmates.

1 Do you know any installation components used on ships? What are they?
2 What do you know about electronic circuit components?

II. READING AND VOCABULARY

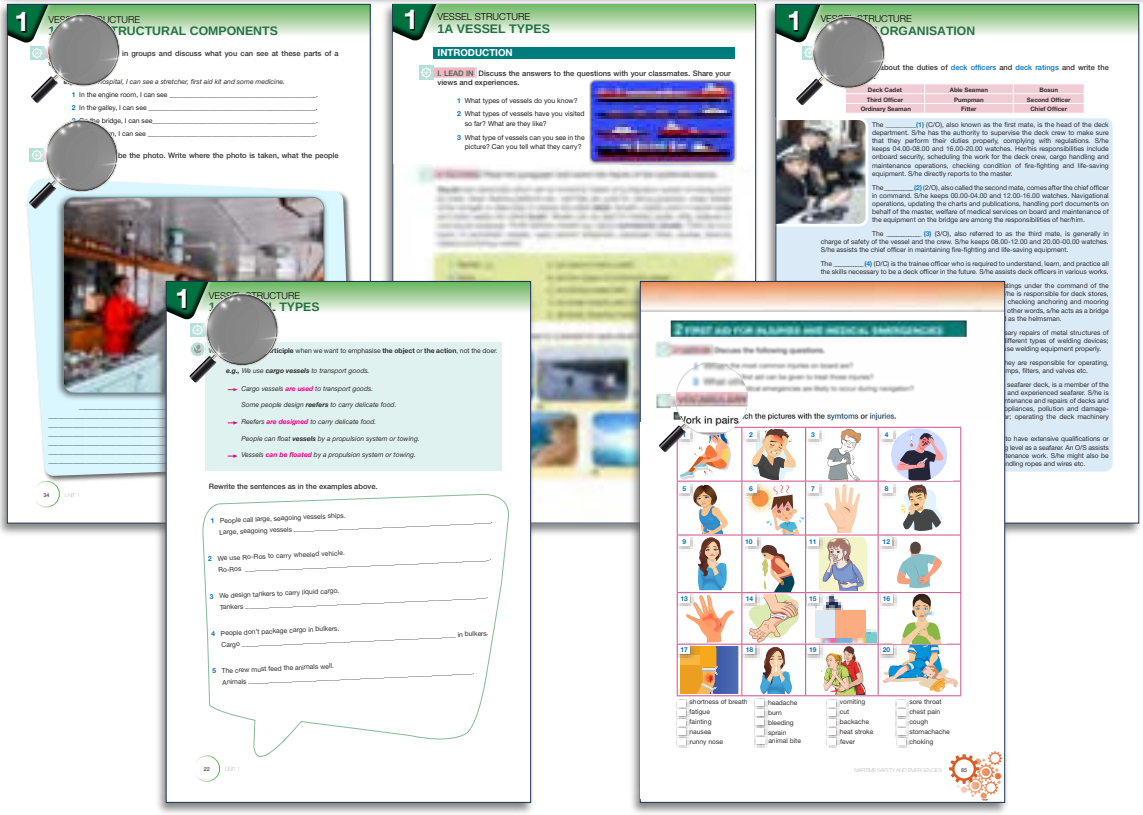
A1 Match the names of the basic electrical installation components with their photos.

Cables ___ A Plug and a socket ___ Cable connection box ___
Holders ___ Buttons and switches ___ Cable cover ___

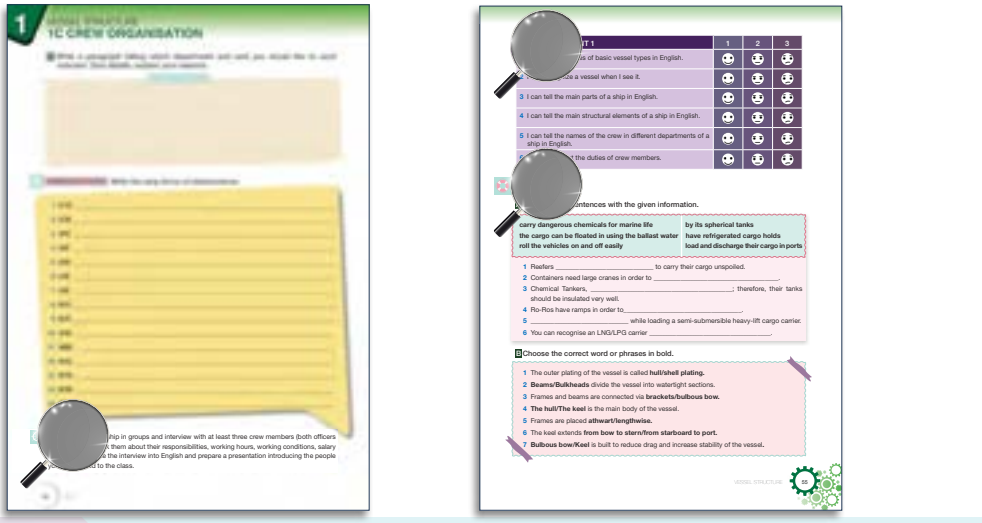
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____

220 UNIT 7

Each part has an introduction to get you familiar with the basic terms, and "Lead in" activities are aimed to prepare and warm you up to the subjects covered in that part. Vocabulary, reading, writing, speaking and language activities in each unit are designed for developing basic skills in foreign language. Group and pair activities are also placed to increase your participation.



At the end of each part, a project is suggested to you. You can work in groups which we hope you can enjoy a team work. We aimed to get you in contact with the people in maritime sector and lead you in the real environments of the sector.
Additionally, at the end of each unit there is a self assessment part that you can evaluate your progress; and a revision part that you can check your knowledge.





1 VESSEL STRUCTURE

In this unit, you will...

- review basic terminology about vessels
- recognise commercial vessel types
- get familiar with a vessel's basic structural components and its main fittings
- learn the bedrocks of a vessel's measurement
- talk about the crew ranks and their duties on board

1 VESSEL STRUCTURE
1A VESSEL TYPES

INTRODUCTION

I. LEAD IN **Discuss the answers to the questions with your classmates. Share your views and experiences.**



1 What types of vessels do you know?

2 What types of vessels have you visited so far? What are they like?

3 What type of vessels can you see in the picture? Can you tell what they carry?

II. READING **Read the paragraph and match the halves of the sentences below.**

Vessels are watercrafts which can be moved by means of a propulsion system or towing such as boats, ships, floating platforms etc., and they are used for various purposes. Large vessels which navigate in deep seas or oceans are called **ships.** Smaller vessels used in coastal areas and inland waters are called **boats**. Vessels can be used for military, public utility, pleasure or commercial purposes. Profit-oriented vessels are called **commercial vessels**. There are four types of commercial vessels: cargo carriers (freighters), passenger ships, auxiliary (service) vessels and fishing vessels.

1 Vessels _c_	a are used to make a profit.
2 Ships ____	b are four types of commercial vessels.
3 Boats ____	c are floating watercrafts.
4 Commercial vessels ____	d are small vessels used in shores and inland waters.
5 There ____	e are large, seagoing vessels.

III. VOCABULARY **Find a word or a phrase for each photo from the paragraph above.**


1


2


3


4


5

IV. SPEAKING AND WRITING

A **Read the dialogue and complete it with the words in the box.**

Shall we go	*1* haven't seen you
have attended	I'll tell you
have always wanted	

Nehir: Hi Arda! How do you do?

Arda: Hi Nehir! It's great to see you here. How do you do?

Nehir: Thank you! It is good to see you, too. I ***haven't seen you*** **(1)** since you moved from our neighbourhood. I am surprised. You _____ **(2)** this school. How nice!

Arda: Yes. I _____ **(3)** to be a captain. I'll work hard to do so. Can you tell me a bit about this school?

Nehir: Of course! _____ **(4)** everything about it; departments, teachers, classes, shop classes… Let me introduce you to my friends first. _____ **(5)** to the canteen?

Arda: It would be great! I don't know anyone here. Let's go!

B **Work in pairs and role-play the dialogue using your own names. Swap the roles and practice again.**

C **Work in pairs and write a similar dialogue using your own names and changing the information.**

V. LEARN THIS

We use **have + past participle** when we talk about an action or a state that started in the past and in progress at the moment, or a time period which has not finished. We also use it for recent events or actions.

e.g., *I* ***have been*** *on a voyage* ***for a few months.***

(I started the voyage a few months ago and I am still on it.)

Arda ***has attended*** *school* ***this year.*** (This year has not finished yet.)

Have *you* ***seen*** *my cap? I can't find it anywhere!* (A recent action)

My co-worker ***hasn't worked*** *today. She is having a day off.* (Today has not finished yet.)

Fill in the gaps with the correct form of the verbs in parentheses as in the examples above.

1 Nehir and Arda _____ (not see) each other for a long time.
2 Nehir _____(be) at this school for a year.
3 I _____ always _____(want) to be a seafarer.
4 We _____ (not have) a day off this week.
5 My uncle is a captain. He _____ (work) on several ships so far.
6 _____ your uncle _____ (return) from the voyage yet?
7 Where _____ you _____(leave) your keys? Don't you remember?
8 Azra _____ (not start) working yet. She's having a gap year.
9 We _____ (live) in the same neighbourhood for 3 years.
10 _____you ever_____ (be) on a tanker ship?

1 CARGO CARRIERS

I. LEAD IN Cargo carriers are also known as freighters. They are used for transporting cargo from one port to another. They carry various types of dry cargo, liquid cargo, or both; and they are named according to the cargo they carry.

Discuss the answers to the questions below with your classmates.

1 Why do you think ships are used to carry cargoes? Share your opinion.

2 Have you ever seen a cargo carrier? What type of a cargo carrier was it?

II. READING **Read the information about vessel types under the photos (A-J) and match with the cargo carriers (1-10).**

1 Bulk Carriers
2 General Cargo Ships
3 Refrigerated Cargo Ships (Reefers)
4 Roll-on/Roll-off (RO-RO) Vessels
5 Container Ships
6 Livestock Carriers
7 Heavy-Lift Cargo Carriers
8 Chemical Tankers
9 Gas Tankers
10 Crude Oil Tankers



A _____ have large hulls, huge gates and ramps. They carry wheeled vehicles such as cars, trucks and lorries. Vehicles must be stowed carefully in order that they can be carried without damage.



B _____ transport crude oil to refineries. Product carriers constitute another type of these vessels and they carry refined products like diesel or petroleum from refineries to ports. Cargo tanks must be leakproof to prevent oil spill, which causes marine pollution.



C _____ carry chemical substances. Their tanks are usually made of stainless steel. These tankers have to comply with MARPOL (International Convention for the Prevention of Pollution from Ships) because they carry hazardous chemicals, which can be a threat for marine life.



D _____ have several holds and large hatch covers. They carry unpackaged dry cargoes such as grain, sugar, coffee, ore etc. in bulk. They are loaded/discharged via spouts, conveyor belts and cranes with grabs. Cleaning and sanitising the cargo holds after altering the cargo is important for these vessels.



E _____ carry Liquefied Petroleum Gas (LPG) or Liquefied Natural Gas (LNG). Their cargo consists of explosive gases; so, it is loaded into their spherical tanks under high pressure and kept in low temperatures.



F _____ transport live animals such as cows, hens and sheep. They have crates or cages to shelter animals. Some of them have open air corrals for ventilation. Temperature adjustment, feeding, watering and ventilating animals adequately are vital issues during the voyage on these vessels.



G _____ carry perishable cargoes such as dairy products, fruit, vegetables, meat, fish etc. They have temperature-controlled holds to keep the cargo chilled or frozen. The speed is important for these vessels in order that they can deliver unspoiled goods to the buyers.



H _____ transport heavy and bulky cargoes such as industrial machinery, locomotives, oil rigs. They have huge cranes to load their cargo. They can be semi-submersible and float the cargo in via ballast water. Stowage and cargo handling need intensive care on these vessels.



I _____ carry various cargoes in shipping containers in standard dimensions (20/40 feet long). These ships generally use cranes and other cargo handling equipment at ports to load/discharge their cargo. Cargo handling can be easier and faster compared to other types of freighters.



J _____ are designed to carry various packaged or palletized goods such as cement, cotton, machinery etc. These vessels are usually equipped with cranes for practical cargo handling at smaller ports which don't have adequate cargo loading/ discharging equipment.

1A VESSEL TYPES

III. VOCABULARY

A Match the photos with the words.

hatch covers	crates	cargo	port	crane	ramp


1


2


3


4


5


6

B1 Match two halves to form meaningful phrases in pairs. Use your dictionaries if you need.

1	Marine	9	a cargo
2	Oil	____	b steel
3	Explosive	____	c controlled
4	Chemical	____	d substances
5	Spherical	____	e pollution
6	Conveyor	____	f spill
7	Stainless	____	g gas
8	Temperature-	____	h belt
9	Perishable	____	i tanks

B2 Choose one phrase from Exercise B1 to complete each sentence below meaningfully.

1 _____ is usually preferred in the construction of a vessel's shell plating to protect it from damages.

2 Tanks of an oil tanker must be sealed in order to prevent_____ which causes_____.

3 _____ are the main structural characteristic of an LNG/LPG carrier.

4 Using a _____ is a very practical way of cargo handling within bulk carriers.

5 _____is usually frozen or chilled, and carried_____ holds on reefers.

6 All necessary precautions must be taken according to MARPOL when transporting _____, because they might be very dangerous for marine life when there is a leak.

C Draw a line between the words and their definitions.

1	hazardous	firmly sealed to prevent outflow
2	stowage	to clean and purify
3	leakproof	dangerous
4	sanitise	to change
5	alter	the act of putting/storing the cargo in an order into the holds

IV. SPEAKING Work in groups and discuss the most important concerns in transporting cargo via following cargo vessels.

Bulkers	Chemical Tankers	Crude Oil Tankers
Ro-Ro Vessels	Gas Tankers	Reefers

e.g., *The most important concern on a* ***livestock carrier*** *is well-being of animals. They should be fed, watered, and ventilated adequately, and their cages or crates should be protective during too cold or too hot weather conditions.*

V. WRITING Work in groups and complete the table describing four of the cargo ships on Pages 18 and 19.

Type of the Ship	*Features*	*Cargo*	*Cargo Equipment*	*Special Concerns*
e.g., *livestock carriers*	*Open air corrals, temperature-controlled cages or crates*	*live animals*	*cages or crates*	*Feeding animals and ventilating their shelters adequately*

1A VESSEL TYPES

VI. LEARN THIS

We use **be + past participle** when we want to emphasise **the object** or **the action**, not the doer.

e.g., *We use **cargo vessels** to transport goods.*

→ *Cargo vessels **are used** to transport goods.*

*Some people design **reefers** to carry delicate food.*

→ *Reefers **are designed** to carry delicate food.*

*People can float **vessels** by a propulsion system or towing.*

→ *Vessels **can be floated** by a propulsion system or towing.*

Rewrite the sentences as in the examples above.

1 People call large, seagoing vessels ships.
Large, seagoing vessels _____.

2 We use Ro-Ros to carry wheeled vehicle.
Ro-Ros _____.

3 We design tankers to carry liquid cargo.
Tankers _____.

4 People don't package cargo in bulkers.
Cargo _____ in bulkers.

5 The crew must feed the animals well.
Animals _____.

2 PASSENGER SHIPS

I. LEAD IN A passenger ship is a kind of commercial ship designed to transport passengers at sea. A ship which transports more than 12 passengers is accepted as a passenger ship by IMO (International Maritime Organisation).

Discuss the answers to the questions below. Share your experiences and views.

1 Have you ever travelled by a ship? What was it like?
2 Can you compare ships with other means of transport? What are the advantages/ disadvantages?
3 What do you know about cruise ships?

II. READING **Read the paragraph and write TRUE or FALSE for the sentences below.**

Passenger Ships

There are two main types of passenger ships which are commonly used today: **Ferries** and **cruise ships**. Ferries carry passengers and vehicles for short cross-water passages on fixed routes. They have a regular schedule and a fixed fare. Cruise ships, on the other hand, are large passenger ships designed for pleasure trips on cruise destinations with several stops along coastlines. They offer a number of onboard facilities such as restaurants, bars, theatres, swimming pools, fitness centres. They arrange voyages to many popular cruise destinations such as Mediterranean and Caribbean Islands. Safety measures, emergency readiness and medical supplies are crucial concerns for passenger ships.

1 Ferries transport more than twelve passengers on board. _____
2 Cruise ships provide shuttle services on fixed routes. _____
3 Passenger ships are not among commercial vessels. _____
4 Cruise ships have recreational facilities for passengers. _____
5 Ferries carry only passengers. _____

III. VOCABULARY

A **Find the names of the ships in the photos from the paragraph above.**





1 _____ 2 _____

1A VESSEL TYPES

B **Find the synonyms of the underlined words from the text on Page 23.**

1 All necessary **precautions** have to be taken carefully in case an emergency situation arises._____

2 The group paid for the holiday in advance, and they were told it was all-inclusive; so, they were annoyed when the agency asked for an additional **fee** for the guide. _____

3 It is **very important** to know the emergency actions and alert systems for every seafarer. _____

4 Due to the bad weather conditions, the ship had to change its **course**. _____

5 They are checking the food stores to make sure that all the **provisions** are loaded. _____

IV. SPEAKING AND WRITING

A **Re-order and write the phone conversation between two old classmates, Hakan and Turgay from maritime school, then role-play it in pairs using your own names and changing the vessel types.**

__ I am working on a chemical tanker. It has been almost a year now.

__ Everything is quite good. Thank you. How about you?

__Yes. I have been on a bulker for a few months. We are on an oceangoing voyage, so my working time is more flexible, I can see many different countries and the salary is not bad, as well.

__ I am doing well, too. I haven't heard from you for so long. What have you been up to lately?

1 Hello!

__ Hi Hakan! It's Turgay. How is everything going with you?

__ Transporting chemicals is risky, so I have to be cautious all the time. It's a bit tiring but I earn quite well and I work for shorter periods like 4 months. What about you? Are you on board?

9 Good to hear that. I am glad to hear from you. We should meet sometime when we are both onshore.

__ See you. Bye!

__ I'd love to do that if we can arrange. Stay in touch!

__ OK. Hope to see you soon.

__ I have never worked on a tanker. What are the conditions like?

Hakan: *Hello!*

Turgay: _____.

Hakan: _____.

Turgay: _____.

Hakan: _____.

Turgay: _____.

Hakan: _____.

Turgay: _____.

Hakan: *Good to hear that. I am glad to hear from you. We should meet sometime when we are both onshore.*

Turgay: _____.

Hakan: _____.

Turgay: _____.

B **Work in pairs. Imagine that you graduated long ago and have been working on a cargo/passenger ship. Write a similar conversation on your notebooks.**

V. LEARN THIS

We use **who** (for people)**, which** (for things) or **where** (for places) when we want to link two sentences about the same person, thing, or place. We omit the subject in the second sentence.

e.g., *A ferry is a ship. It carries vehicles and passengers. => A ferry is a ship* ***which*** *carries vehicles and passengers.*

A seafarer is a person. S/he works at sea. => A seafarer is a person ***who*** *works at sea.*

Rewrite the sentences like in the examples above. Use who, which or where.

1 There are a few people at the port. They are waiting for the approaching ship.

_____.

2 A cruise ship is a passenger ship. It has a lot of recreational activities on board.

_____.

3 Ro-Ros are huge vessels. They can carry thousands of vehicles at a time.

_____.

4 A port is a place. Ships are loaded and discharged there.

_____.

3 AUXILIARY VESSELS

I. LEAD IN Auxiliary vessels are built to support other vessels in various ways such as salvage, towing, clearing the way from obstacles, transporting crew members, providing provisions, fuel, equipment etc. Some are designed to do underwater infrastructure. **Tugs, dredgers, icebreakers, offshore support vessels (OSV)** and **cable layers** are widely used auxiliary vessels.

Discuss the answer to the question below. Share your experiences and views.

Have you ever seen an auxiliary vessel? What type of an auxiliary vessel was it?

II. READING AND VOCABULARY

A Match the words with their definitions related to auxiliary vessels.

1	salvage *e*	a	to fasten a vessel by a rope
2	scrape _____	b	the bottom of the sea
3	infrastructure _____	c	to remove something from the sea-bottom by a dredging tool
4	widen _____	d	to accompany a ship in obstructed waterways
5	seabed _____	e	rescuing a disabled ship
6	manoeuvre _____	f	to uphold good condition, to keep operating
7	have a breakdown _____	g	to make wider
8	maintain _____	h	to steer a vessel for turning or directing it to a course
9	moor (a vessel) _____	i	to have a mechanical failure
10	escort (a ship) _____	j	the basic structure used for public energy, water, transport etc

B Read the sentences and write the names of the auxiliary vessels.

Tugs	OSVs	Cable Layers	Icebreakers	Dredgers

1 _____ break the ice on ice-covered water to clear the way for other vessels.
2 _____ are used to widen and deepen narrow canals for larger vessels.
3 _____ escort large vessels when moving in and out of ports, or carrying hazardous cargoes.
4 _____ meet various needs of other ships such as personnel, provisions, fuel etc.
5 _____ tow or push vessels when they have a breakdown.
6 _____ lay and maintain underwater power and data cables.
7 _____ have powerful engines and specially designed bows to break the thick layer of ice.
8 _____ are used to repair underwater cables when they have a breakdown.
9 _____ can be used in buliding and reparing offshore rigs and platforms.
10 _____ scrape and remove various types of materials such as sand, gravel, and contaminants from the seabed.

C Write the names of auxiliary vessels under the photos.



1



2



3



4



5

III. SPEAKING AND WRITING

In groups, discuss the answer to the question below. Then, make a list of differences you have discussed with your group mates.

What are the differences between an auxiliary vessel and a cargo vessel?

e.g., *A cargo vessel has cargo holds or cargo tanks, but an auxiliary vessel does not.*

IV. LEARN THIS

We generally make plural forms by adding **-s/-es/-ies** at the end of nouns, but some words' forms completely change while some others remain the same.

e.g., *ship – ships* *knife – knives* *fox – foxes* *dress – dresses* *watch – watches*

facility – facilities *hero – heroes* *fish – fish* *woman – women* *mouse – mice*

Look at the rules above and write the plural/singular forms of the words.

SINGULAR	PLURAL
cargo	_____ (1)
_____ (2)	refineries
gas	_____ (3)
_____ (4)	vehicles
supply	_____ (5)
_____ (6)	people
sheep	_____ (7)
seaman	_____ (8)
_____ (9)	halves
box	_____ (10)

4 FISHING VESSELS

I. LEAD IN

Fishing vessels are used to catch marine species such as fish, whales, seals, or freshwater fish. There are multiple types of commercial fishing vessels today. **Trawlers, seiners, liners, gillnetters, crabbers** and **fish processing vessels** are among the most widely used ones.

Discuss the answers to the questions below. Share your views.

1 Have you ever seen a fishing vessel? What type of a fishing vessel was that?

2 What kind of equipment is used on fishing vessels?

II. READING AND VOCABULARY

A Match the words with their meaning.

1 drag _____	a creatures living in open seas, near the water surface
2 pelagic species _____	b to tie something like a bag by pulling its strings
3 purse _____	c a curved tool used for holding or catching things
4 hook _____	d to move something by pulling it along a surface with difficulty

B Work in pairs and match the fishing vessels with the sentences defining their fishing methods.

1 Gillnetters____	A A trawling net is lowered down and dragged under the water, and then a wide array of fish is hauled by a mechanical system.
2 Fish Processing Vessels____	B Pelagic species are caught by a surrounding seine net. The net is pursed when the catch enters in, and then it is pulled up.
3 Crabbers____	C The fish is caught by means of long fishing lines and hundreds of baited hooks.
4 Longliners____	D A gillnet system and manual or mechanical hauling equipment is used.
5 Seiners____	E Specialized fishing equipment and automatic windlasses are used to catch crabs.
6 Trawlers_____	F Large oceangoing vessels are used to process the hauled fish in open seas. They have necessary equipment on board for various processes such as sorting, cleaning and freezing.

C Write the names of the fishing vessels.





1_____ 2_____ 3_____

III. SPEAKING **Discuss the answer to the question in groups and then share your views with the class.**

What are the difficulties of working on a fishing vessel?

e.g., *It is difficult to fish and handle the caught fish in cold weather.*

IV. WRITING **Write a short paragraph about what type of a vessel you would like to work on in the future. Give details and explain your reasons.**

ABBREVIATIONS **Write the long forms of the abbreviations below.**

1 IMO _____

2 MARPOL _____

3 Ro-Ro_____

4 LNG _____

5 LPG _____

6 OSV _____

PROJECT Record a video or take photos of different types of vessels in your town/city and prepare a presentation giving details about the type of vessels.

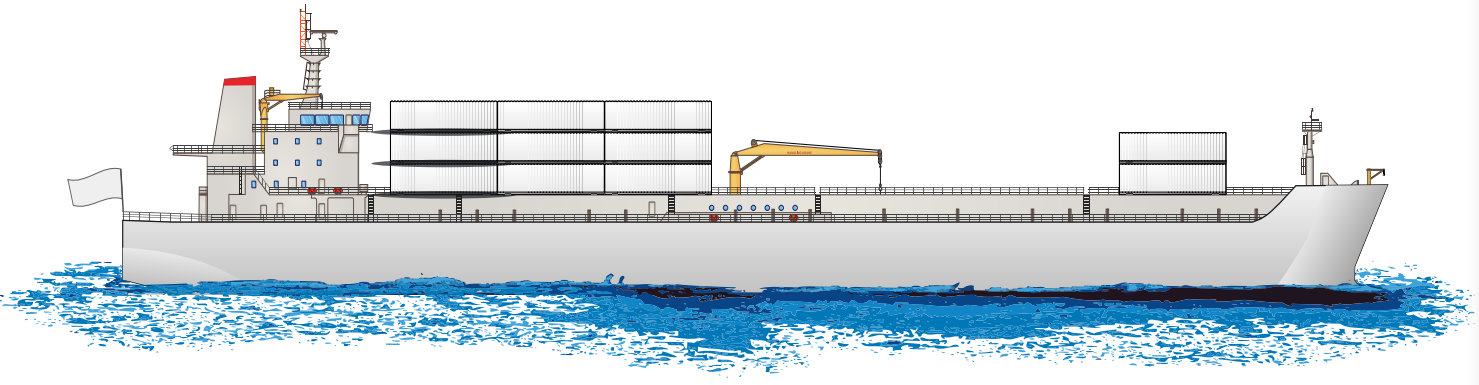
VESSEL STRUCTURE

1B MAIN STRUCTURAL COMPONENTS

INTRODUCTION

I. LEAD IN Discuss the following question in the classroom.

Can you name any structural components that you see in the picture below? What are they?



II. READING Read the paragraph and answer the questions.

A vessel's structure consists of structural components, machinery and fittings. Structural features vary depending on the size or the type of the vessel. A conventional ship can roughly be divided into two main parts: the **hull** and the **machinery**. The hull is the main body of the ship. It consists of various structural elements. The machinery includes all devices and equipment that enable the ship to function. In this section, you will get familiar with main parts of a vessel, major compartments, main structural elements, some basic fittings and equipment and measurement of dimensions and cargo capacity of a ship.

1 What are the main parts of a ship? _____

2 What is the hull? _____

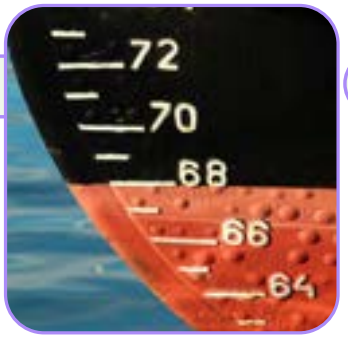
3 What is the machinery? _____

4 What are measured on a ship? _____

III. VOCABULARY Match the photos with the words. Write number of the words on the pictures.

1 A compartment	2 Structural elements	3 Measurement
4 A main fitting	5 A piece of machinery	6 A mooring device













IV. LEARN THIS

Some verbs are used with specific prepositions such as **at**, **up**, **to** etc. They are called **"Prepositional Verbs"**

Match the verbs with the correct prepositions to form prepositional verbs.

on	out	into	with	up	down	of

1 A vessel is divided _____ several parts and compartments.

2 The anchor is pulled _____ by means of a chain or a rope.

3 The crew consists _____ the people who work on a ship.

4 The cargo capacity of a ship highly depends _____ its volume and weight.

5 The crew must lower _____ the anchor to stabilize the vessel and prevent drifting.

6 Every seafarer should get familiar _____ standard rules of marine conventions.

7 Cargo handling must be carried _____ very carefully on chemical tankers.

1 MAIN PARTS OF A VESSEL

I. LEAD IN

Vessels are divided into sections and compartments. While talking about the location of everything in it, we use the names of these sections or compartments.

e.g., *"The rudder is at* ***the stern.****"* or "*The main engine is in* ***the engine room.*****"**

Answer the questions below. Share what you know with your classmates.

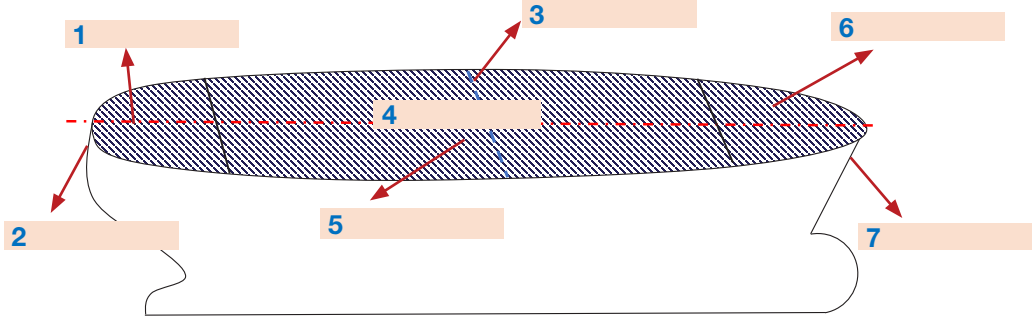
1 Do you know what sections a vessel consists of?

2 Can you name any of the compartments of a ship?

II. READING AND VOCABULARY

A Read the paragraph about the main parts of a vessel and write the words in bold in the correct box on the picture.

A vessel can be roughly divided into seven parts. The front part of the vessel is called **forepart** and the back part is called **after part**. The **amidships** is the middle part of the vessel. When you stand in the *centreline** facing forward, the right-hand side of you is the **starboard side**; the left-hand side of you is the **port side**. **Bow** is the frontmost part, and **stern** is the rearmost part of a vessel.



B Read the information about the major compartments of a vessel and complete the sentences below.

- **Gangway** is the entrance of the ship.
- **Decks** are flat spaces between the compartments of the ship.
- **Bridge** is the navigating and commanding office of the ship.
- **Engine room** is the room which holds the main engine and auxiliary machinery.
- **Accommodation** is the compartment holding the living and resting spaces for the crew and passengers.

1 The master and officers manage the navigation from the _____.

2 The crew and/or the passengers use the _____ to embark and disembark.

3 _____ provide passage for the crew and the passengers between the compartments of a ship.

4 Cabins, galley, laundry room and mess rooms are in the _____ of the ship.

5 The ship is propelled from the _____.

**Centre Line is an imaginary line which is assumed to divide the vessel into two equal parts longitudinally.*

C Write the names of the compartments of a ship shown on the photos.

1



3



2



4



5



1 _____
2 _____
3 _____
4 _____
5 _____

D Match the basic parts of the accommodation on a conventional ship with their functions.

1 The crew can rest and sleep in _____.	a provision stores
2 Meals are prepared and cooked in the_____.	b hospital
3 Clothes or sheets are washed, cleaned, and ironed in the _____.	c mess rooms
4 The officers and crew eat and rest in _____.	d galley
5 Medical care is provided in the _____.	e laundry room
6 Variety of provisions are stored in _____.	f cabins

1B MAIN STRUCTURAL COMPONENTS

III. SPEAKING **Work in groups and discuss what you can see at these parts of a vessel.**

e.g., *In the hospital, I can see a stretcher, first aid kit and some medicine.*

1 In the engine room, I can see _____.

2 In the galley, I can see _____.

3 On the bridge, I can see_____.

4 At the stern, I can see _____.

IV. WRITING **Describe the photo. Write where the photo is taken, what the people are doing etc.**



_____

_____

_____

_____

_____

_____

_____

2 MAIN STRUCTURAL ELEMENTS

I. LEAD IN

Structural elements are metal, steel, or aluminium members that form the body of a vessel.

Discuss the answer to the following question.

What forms the structure of a vessel? What structural elements can you name?

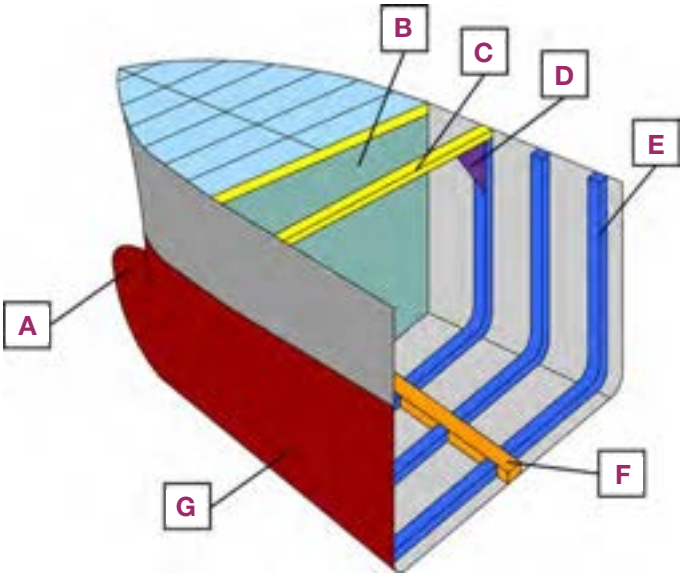
II. READING AND VOCABULARY

A Match the words with their definitions.

1 lengthwise _____	a to make stronger
2 athwart _____	b the situation of a vessel being pulled by external forces such as waves, wind etc.
3 to strengthen _____	c from side to side, transverse
4 watertight _____	d rising and falling movement of a vessel to the sides by the force of waves and wind
5 rolling _____	e in the direction of length
6 drag _____	f sealed well for not allowing the water passage

B Match the words for structural elements in the box with the correct numbers in the picture below.

1 Beam__	2 Bracket__	3 Bulbous Bow__	4 Frame__	5 Keel__	6 Bulkhead__	7 Shell Plating__



1B MAIN STRUCTURAL COMPONENTS

C **Complete the text using the words in Exercise B on Page 35. Use the plural forms of the words when necessary.**

Like people, vessels have a body. They have a skeleton, skin and layers of tissues. The main body of a vessel is its hull. It encloses everything else in it. The skeleton consists of the keel, frames, beams, brackets, and bulkheads. The ***keel*** **(1)** has the role of backbone and supports the body. It extends along the hull lengthwise, from the bow to the stern, and all frames are connected to it. _____ **(2)** form the skeleton of the vessel intersecting the keel athwart like ribs. They are built to support the hull together with the keel. _____ **(3)** are also primary structural elements and play a vital role in supporting the hull against the pressure of water and strengthening the sides. They are attached to the top ends of the frames by metal connectors called _____ **(4)** and join the frames together. _____ **(5)** are also significant in providing isolated sections to reduce damage or hazard in case of an accident. They are vertical partition walls dividing the vessel both athwart and lengthwise into watertight sections. The outer skin of a vessel is called _____ **(6).** It is a watertight plating which encloses the hull and provides protection to it like a shell. It is usually made of steel. _____ **(7)** is a bulb-like extension at the vessel's bow, below the waterline. It has an essential function in reducing pitching and increasing the stability and speed of the vessel. It also protects the bow of the ship in case of a collision.

D **Read the paragraph and write TRUE/FALSE for the sentences below. Correct the false information.**

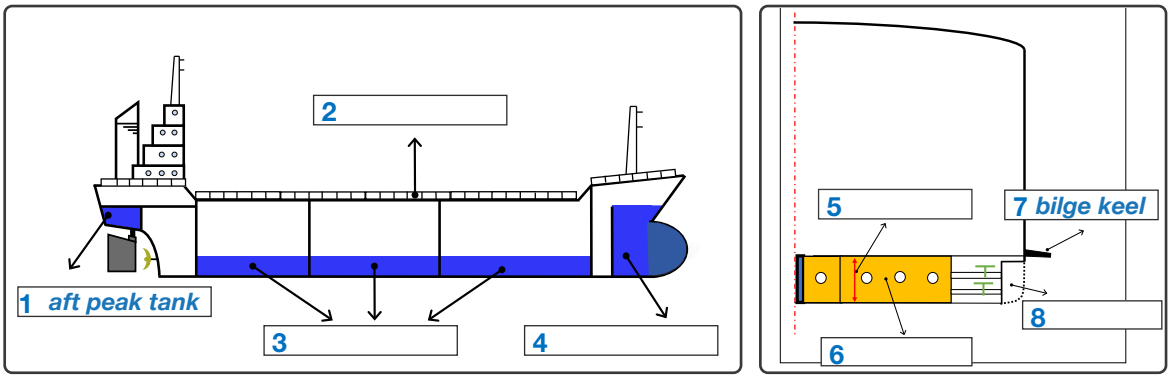
1 Frames are attached to the keel of the vessel. _____
2 Shell plating is the outer skin of the hull. _____
3 Bulbous bow divides the hull into watertight sections. _____
4 The keel is an extension at the bow. _____
5 Brackets connect frames and beams. _____

E **Match the two halves of the sentences describing the structural components of a vessel.**

1 **Bulwark** forms sidewalls around the decks ***e***
2 **Double bottom** consists of two watertight layers ____
3 **Sea chest** has portable grates and strainers for seawater intake ____
4 **Bilge** is the lowest inside part of a vessel, ____
5 **Floors** are among strengthening components of bottom structure ____
6 **Bilge keels** are fin-like plates mounted at two sides of the vessel ____
7 **Ballast tanks** are filled with ballast water or discharged depending on the cargo weight ____
8 **Aft peak tank** and **fore peak tank** may ____

a to increase the stability of the vessel.
b leaving a space between the inner bottom and shell plating.
c contain both ballast water and fresh water.
d designed to reduce rolling.
e to prevent seawater entry.
f to where the wastewater of the vessel is drained.
g that is used for various purposes such as ballast, cooling, or firefighting etc.
h which have holes.

F Write the bold words from Exercise E on Page 36 in the boxes on the picture below.



III. WRITING Write the functions of these parts using your own words.

e.g., *The keel supports the vessel like a backbone.*

1 Frames _____.
2 Ballast tanks _____.
3 Shell plating _____.
4 Sea chest _____.

IV. LEARN THIS

We use **adjectives** when we describe how something, someone, somewhere is; however, we use **adverbs** while talking about how an action is carried out. Normally, we add **-ly** to the end of the adjective to form adverbs but there are some exceptions like **fast** and **hard** that remain the same; and good becomes **well**.

Choose the correct forms of the words to complete the sentences.

1 Gas tanker crew must be very **careful/carefully** when they handle the cargo.
2 Our lives would be easier if everyone did their job **proper/properly**.
3 Who is **responsible/responsibly** for the machinery of the ship?
4 Children of poor families cannot be fed **adequate/adequately**.
5 I have prepared for the test very **good/well.**
6 Carrying chemical cargo is a **dangerous/dangerously** job.
7 Cargo ships are **common/commonly** known as freighters.
8 The cargo spaces, holds or tanks are **special/specially** designed for specific type of cargoes.

3 MAIN FITTINGS AND EQUIPMENT

I. LEAD IN

A vessel is fitted with a variety of gears and equipment for different purposes. These fittings and equipment vary depending on the vessel type and its load. There is some basic equipment for steering, manoeuvring, mooring and cargo handling which we can see in most commercial vessels.

Answer the following questions. Discuss your answers with your classmates.

1 What main fittings of a commercial ship do you know?

2 Can you name is the main cargo equipment that most cargo ships use?

II. READING

A Work in groups. Read two columns and match the equipment with their functions. Make use of the clues in their definitions.

MAIN FITTINGS AND EQUIPMENT	FUNCTIONS
1 **The funnel** can be thought as the chimney of a ship, usually located in the after part of the ship. ____	**A** It takes over the power of the engine from the shafts and propels the vessel against water helping it move.
2 **Masts** are vertical posts on decks. Main Mast is at after part and Fore Mast is on Forecastle. ____	**B** It is used to moor the vessel to the sea bottom and hold it still to prevent drifting.
3 **A rudder** is a blade-like device vertically fitted at the stern. ____	**C** It is used for hoisting and releasing the anchor and other heavy objects like windlass.
4 **An anchor** is a heavy object tied to the vessel by a chain or a cable. It is generally located at the bow. ____	**D** They ease moving to starboard and port sides and facilitate manoeuvring.
5 **A propeller** consists of a hub and rotating curved shafts. It is located at the stern. _*A*_	**E** It is used to discharge smoke or exhaust gases coming from the engines and generators.
6 **Bow/Stern thrusters** are like propellers fitted on the stern or the bow enclosed by a tunnel. ____	**F** It is used for pulling up or lowering down the anchor and heavy weights.
7 **A windlass** is a horizontal cylinder rotated by a crank or another mechanical power. It is located at either the bow or the stern. _____	**G** They hold navigational lights, flag yards, radio antennas etc.
8 **A capstan** is a vertical cylinder or a barrel which can be rotated by a mechanical power, located at either bow or the stern. _____	**H** It is used to steer and manoeuvre a vessel.

B Read and complete the sentences related to cargo equipment on board with the given words.

cargo holds	cranes	hatch covers	cargo pumps	cargo pipelines	cargo tanks

1 _____ are cylinder tubes which liquid can pass through. They are used to load and discharge liquid cargo on liquid cargo carriers.

2 _____ usually consist of an impeller, an impeller shaft and a casing connected to a pipeline. They are used to pump liquid cargo out of cargo tanks.

3 _____ are cylinder or spherical containers generally used on liquid cargo carriers. They are designed for transporting liquid or liquified cargo.

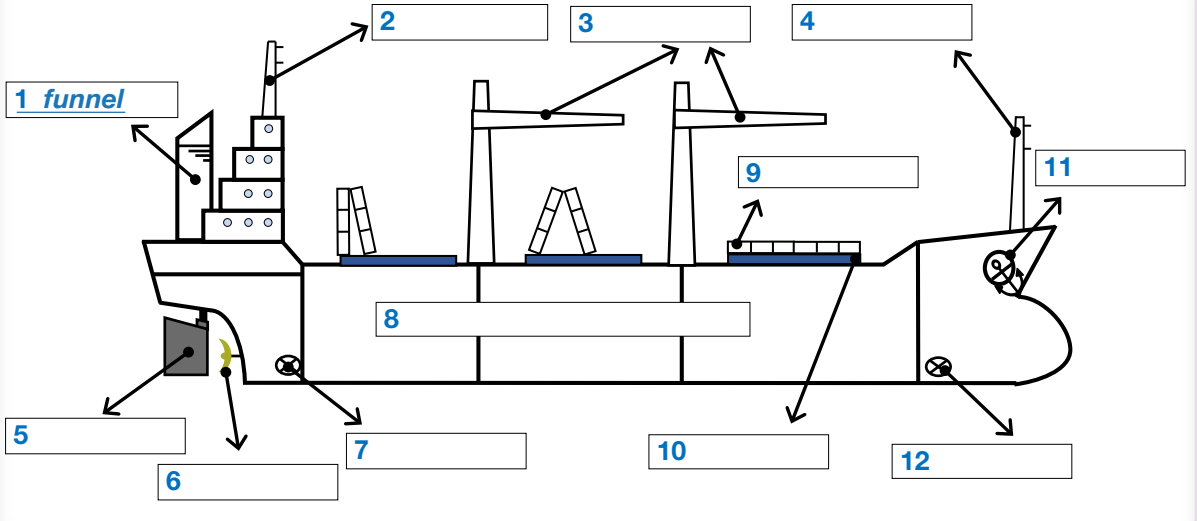
4 _____ are large gears constructed on cargo carriers. They assist loading and unloading heavy cargoes on cargo carriers.

5 Hatch coamings and _____ are the components on the holds of a cargo vessel providing watertightness. They are designed to protect the cargo from external damage.

6 _____ are large, enclosed spaces on a conventional cargo vessel. They are designed for storing and protecting dry cargo during the transportation.

III. VOCABULARY

A Work in pairs and write the names of main fittings and equipment on the picture. Use the information in previous exercises in this section.



VESSEL STRUCTURE

1B MAIN STRUCTURAL COMPONENTS

B Match the components or equipment with the pictures.

1 cargo hold___ 3 bow thruster___ 5 propeller___ 7 capstan___ 9 rudder___
2 piping system___ 4 windlass___ 6 anchor___ 8 funnel___

A 

B 

C 

D 

E 

F 

G 

H 

I 

IV. SPEAKING AND WRITING

A Work in pairs. Ask and answer questions about the features, locations and functions of structural components, and write your partner's answer.

e.g., Student A: *Where is the bridge?* ***Student B:*** *It's at the after part.*
Student B: *What is a crane used for?* ***Student A:*** *It's used for loading cargo.*

B Put a tick if your partner's answer is correct. If not, write "incorrect". Swap the papers and check your mistakes.

4 MEASUREMENT

I. LEAD IN

Measurement of a vessel is conducted on various basis including dimensions, weight and volume. It is necessary to carry out these measurements because each of them is beneficial in specific operations such as manoeuvring in shallow waters or accounting cargo capacity of a vessel.

Discuss the answers to these questions with your classmates.

1 Do you know how the dimensions of a vessel are measured?
2 How do you think a vessel is weighed?

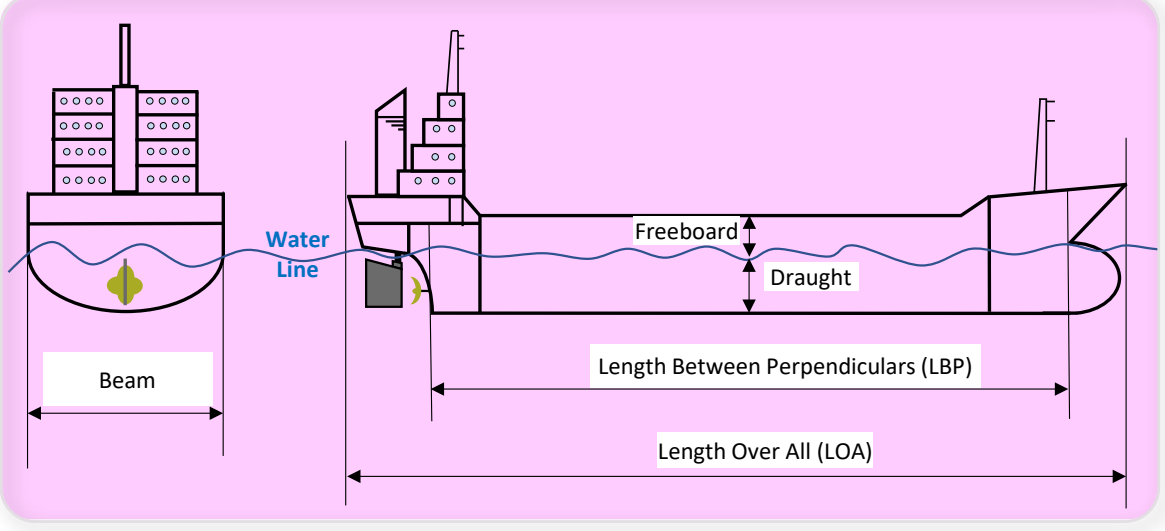
II. READING AND VOCABULARY

A Work in pairs and write the words in the sentences that they are defined.

essential	**stability**	**perpendiculars**	**docking**
buoyancy	**permit**	**dimensions**	

1 The _____are the length, width, height and draught of a vessel.
2 _____ means the capability of floating on water.
3 To _____ means to allow to do something.
4 If something is _____, it means that it is quite necessary and important.
5 _____ is the process of mooring the vessel at a particular place to carry out the routine checks, maintenance and repairs.
6 _____ are the imaginary lines at the bow and the stern of the vessel which are drawn to measure the vessel's length.
7 The ability of a vessel to stay in its position firmly by resisting against external forces is called _____.

B Look at the picture and complete the text on Page 42.



1B MAIN STRUCTURAL COMPONENTS

Measuring the **depth** and the **height** of a vessel is essential for having an idea about the vessel's buoyancy and stability with the maximum permitted load. The _____ **(1)** is the distance from the waterline to the deepest part of the vessel's bottom, which is generally shown by marks on each side. The distance between the waterline and the vessel's upper deck is called _____ **(2)**. These values are important for a safer voyage on shallow water, e.g., while entering/leaving ports, and for determining the maximum weight that the vessel can safely transport. The measurement of the **width** and the **length** of a vessel is also important for stability, safe manoeuvring, docking, and determining the volume of cargo spaces. The width of the vessel is called the _____ **(3).** _____ **(4)** is the length of a vessel's hull between the extreme points of after and fore ends when it is parallel to the waterline, and _____ **(5)** is the length of the vessel's hull between fore and aft perpendiculars. Other measurement values are **displacement** and **tonnage**. They are used for measuring the **weight** and the **volume** of the vessel.

C **In the exercise below, tonnage is used to describe the volume, displacement is used to describe the weight. Work in pairs and match the terms with their definitions.**

1 Light Displacement ____
2 Net Tonnage (NT) ____
3 Displacement ____ *a*
4 Deadweight (DWT) ____
5 Loaded Displacement ____
6 Gross Tonnage (GT) ____

a It is the maximum weight that a vessel can carry.

b The whole internal volume of a vessel including its stores, tanks, holds, bridge and accommodation.

c The internal volume of a vessel which can be used for transporting cargo or passengers.

d The weight of the water displaced by the vessel at a particular draught. It gives the vessel's own weight.

e The vessel's own weight with all of its machinery, fittings and components excluding its cargo.

f The weight of a vessel with everything loaded on board including the cargo, fuel, provisions, ballast water, crew and passengers.

III. SPEAKING AND WRITING

Discuss the following question with your partner; and then write a short paragraph including your answer to the question.

Why is it important to measure a vessel's dimensions, weight and volume?

e.g., *It enables us to maintain the vessel's stability during navigation.*

IV. LEARN THIS

Some words can be used in different forms such as **nouns**, **adjectives**, and **verbs**. We should carefully use them to give our message correctly.

Work in pairs. Write the required forms of the given words below.

NOUN	ADJECTIVE	VERB
length	1_____	
measurement		2_____
3_____	deep	
4_____		displace
distance	5_____	
6_____	wide	
7_____		weigh
height	8_____	

ABBREVIATIONS

Write the long forms of the abbreviations below.

1 **LOA** _____

2 **LBP** _____

3 **DWT** _____

4 **NT** _____

5 **GT** _____

PROJECT

Visit a shipyard in groups and view the structural components of a ship closely. Talk to people there and search how the partitives are attached together to build a ship. Take photos and takes notes and prepare a presentation about your research.

1C CREW ORGANISATION

INTRODUCTION

I. LEAD IN

The crew of a vessel consists of the people who are responsible for several duties to carry on onboard operations. Each crew member has a specific job description to let her/him know what to do while working in coordination with other crew members. To do this properly, there is a standard ranking system for most commercial vessels. For each rank, a number of qualifications are required such as training, certification, experience, language level etc. Majority of these qualifications are standardized by an international convention, STCW (Standards of Training Certification and Watchkeeping).

Answer the questions using the information in the text and share your own views.

1. Why do you think the ranking system is necessary on board?
2. What can be the role of STCW in the crew organisation?
3. Who do you think the people in Photo-1 and Photo-2 are? What are they doing?

1



2



II. VOCABULARY

A Work in pairs. match the basic terms related to crew with their definitions.

1	seafarer___	a	to be present at somewhere, act or speak for someone else
2	rank___	b	the captain
3	officer___	c	to work under someone who has the authority to supervise you
4	engineer___	d	to do a job or to perform an activity
5	cadet_*h*_	e	an agreement for rules or regulations
6	rating___	f	all necessary training, certification, knowledge and skills to do a job
7	keep watch___	g	a person who works on a ship
8	report to (someone)___	h	trainee officer
9	be in charge of___	i	a person who works under the command of officers on board
10	qualification___	j	a position in a hierarchical system
11	carry out___	k	a person who is in charge of the engines and other machinery
12	oversee___	l	to observe and hold control of something/somewhere for a period time
13	the master___	m	to be responsible for
14	represent___	n	to manage and/or supervise a work to ensure it is done properly
15	convention_*e*_	o	a person who has the authority to command

B Write the correct words from Exercise A on Page 44.



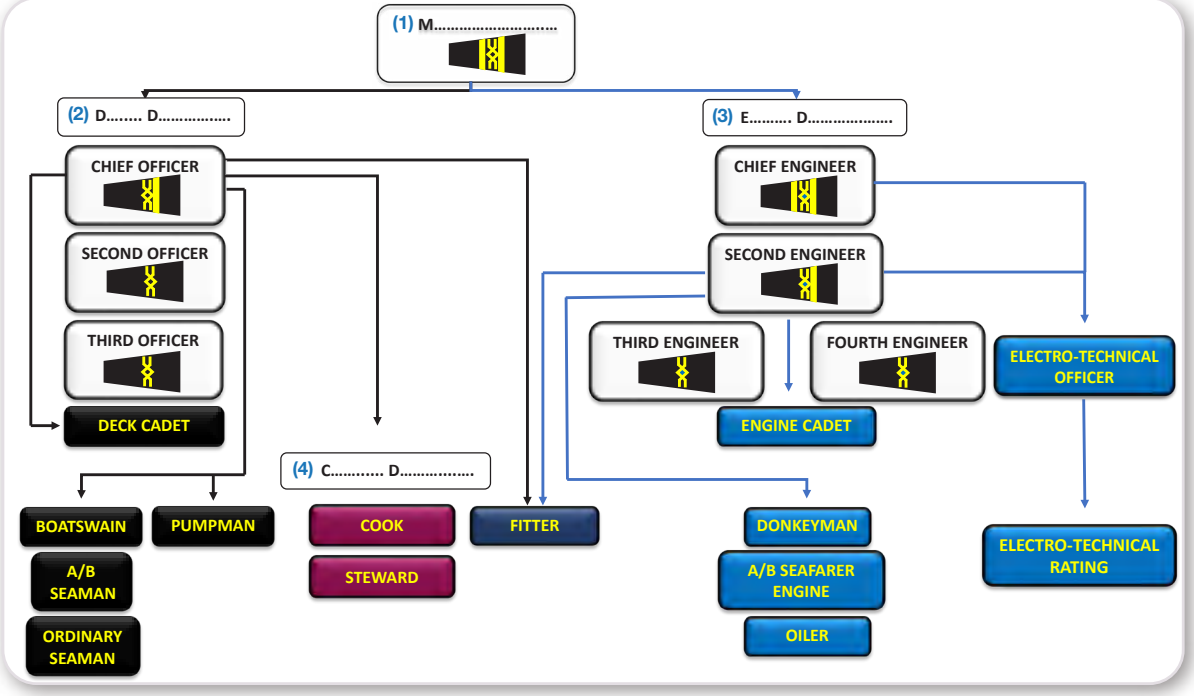
1 2 3 4 5

III. READING

A Read the paragraph and complete the diagram using the words in bold.

CREW RANKS

Crew ranks are usually defined under three departments: **Deck**, **Engine** and **Catering**. **The master** should be taken separately, because s/he oversees and is in charge of the operations in all departments of the vessel during the navigation, representing the company or the ship owner. The master holds the highest rank on board. S/he has a wide range of responsibilities such as crew and passengers' safety; emergency measures; cargo handling operations, maintenance of the vessel, communications with the shore, reports and records. The master supervises all officers, engineers and other crew regularly to ensure that the work is carried out complying with regulations.



B **Read the paragraph again, study the diagram and answer the questions accordingly.**

1 What are the main departments on a conventional commercial vessel?
2 Who works with more than one department on board?
3 What are the responsibilities of the master?
4 Who does the boatswain report to?
5 Who is the head of the engine department?
6 Who are the ratings of the engine department?

IV. SPEAKING

Read the dialogue and role-play it with a partner. Use your own names and change the crew member and the responsibilities.

Alex : Hello. I'm Alex, the new oiler.
Mehmet: Hello Alex. I'm Mehmet. I am the donkeyman of the ship. I am responsible for the engine crew.
Alex : Nice to meet you!
Mehmet: Come on! Let's introduce you with the engine crew. They'll show you around the engine room.
Alex : Oh, OK. Thank you!

V. WRITING

Write a paragraph describing which job you want to choose in the future. Give your reasons.

_____
_____
_____
_____
_____
_____

VI. LEARN THIS

We use be + adjective + prepositions **to form new phrases.**

Write the prepositions in the sentences. You can use some of them more than once.

for	of	with	in

1 The Master is in charge _____ everybody and everything on the vessel.
2 The engine crew is under the command _____ the chief officer.
3 Each crew member has to be familiar _____ the safety precautions onboard.
4 We are working in coordination _____ the other departments.
5 A bosun is usually experienced _____carrying out most of the deck work.
6 Who is responsible _____ medical services onboard, during voyage?

1 DECK CREW

I. LEAD IN

Deck department is responsible for the vessel's navigation, cargo handling, berthing and anchoring operations, maintenance of the hull, cargo spaces, cargo gear, safety equipment and deck fittings. Deck department crew consist of deck officers and ratings.

Discuss your answers to the following questions with your classmates.

1 Do you know who holds the highest rank in the deck department?

2 Which rank would you choose for yourself in the deck department? Give your reasons.

II. VOCABULARY

A Match the words with the photos.

helmsman	watchkeeping	welding	regulation	life-saving appliances	nautical chart









1_____ 2_____ 3_____ 4_____ 5_____ 6_____

B Work in pairs and write the required forms of the words below.

VERB	NOUN	ADJECTIVE
navigate	navigation	1 _____
2 _____	maintenance	maintained
berth	3 _____	
	responsibility	4 _____
5 _____	involvement	involved

C Fill in the gaps with a word or phrase from Exercise A or B. Use plural forms if necessary.

1 Seafarers have to do their job according to _____ in order to _____safely.

2 _____ is a risky work; so, a protective shield must be worn.

3 _____ are very important in case of an accident; so they have to be _____ regularly.

4 _____ are essential during navigation, so they must be updated regularly.

5 Officers often assign a rating as a _____ to steer the vessel.

6 Daily _____ at designated times is among the main _____ of officers.

III. READING

A Read the text about the duties of deck officers and deck ratings and write the correct ranks.

Deck Cadet	Able Seaman	Bosun
Third Officer	Pumpman	Second Officer
Ordinary Seaman	Fitter	Chief Officer



The _____**(1)** (C/O), also known as the first mate, is the head of the deck department. S/he has the authority to supervise the deck crew to make sure that they perform their duties properly, complying with regulations. S/he keeps 04.00-08.00 and 16.00-20.00 watches. Her/his responsibilities include onboard security, scheduling the work for the deck crew, cargo handling and maintenance operations, checking condition of fire-fighting and life-saving equipment. S/he directly reports to the master.

The_____**(2)** (2/O), also called the second mate, comes after the chief officer in command. S/he keeps 00.00-04.00 and 12.00-16.00 watches. Navigational operations, updating the charts and publications, handling port documents on behalf of the master, welfare of medical services on board and maintenance of the equipment on the bridge are among the responsibilities of her/him.

The _____ **(3)** (3/O), also referred to as the third mate, is generally in charge of safety of the vessel and the crew. S/he keeps 08.00-12.00 and 20.00-00.00 watches. S/he assists the chief officer in maintaining fire-fighting and life-saving equipment.

The _____**(4)** (D/C) is the trainee officer who is required to understand, learn, and practice all the skills necessary to be a deck officer in the future. S/he assists deck officers in various works.

The _____ **(5)**, or the boatswain, is the head of deck ratings under the command of the chief officer. S/he is involved in scheduling the deck work. S/he is responsible for deck stores, maintenance and repairs of the hull, decks, and windlasses, checking anchoring and mooring operations and reporting to the chief officer about the work. In other words, s/he acts as a bridge between the officers and the ratings. He/she can be assigned as the helmsman.

The _____ **(6)**, or welder, is required to carry out necessary repairs of metal structures of the hull and decks, tanks, pipes and the machinery using different types of welding devices; therefore, s/he must have the required training and ability to use welding equipment properly.

The _____ **(7)** is employed specifically on tankers and they are responsible for operating, maintaining, and repairing liquid cargo equipment such as pumps, filters, and valves etc.



An _____**(8)** (A/B), also called able seafarer deck, is a member of the deck department who is a well-trained and experienced seafarer. S/he is assigned in various duties such as maintenance and repairs of decks and superstructure; handling life-saving appliances, pollution and damage-control equipment and the cargo gear; operating the deck machinery used in anchoring and mooring.

An _____ **(9)** (O/S) does not need to have extensive qualifications or experience since s/he is at the beginning level as a seafarer. An O/S assists A/B during cargo operations and maintenance work. S/he might also be given minor duties such as cleaning, handling ropes and wires etc.

B Read the paragraphs and write True/False for the sentences.

1 The C/O supervises the work in the deck department. _____
2 The Bosun supervises the work of officers _____
3 A pumpman works on liquid cargo carriers _____
4 An O/S is more experienced than an A/B _____
5 Deck Officers keep watch two times a day _____

C Complete the sentences according to the text in Exercise A on Page 48.

1 _____is responsible for updating the charts and publications.
2 A _____ has to observe the work of officers very carefully.
3 It is _____'s responsibility to maintain fire-fighting and life-saving equipment.
4 Welding is a dangerous job; so, a _____ must be trained well for it.
5 _____acts like a foreman at the deck department and has the authority to command ratings.

D Complete the table with the correct rank from the paragraphs in Exercise A on Page 48.

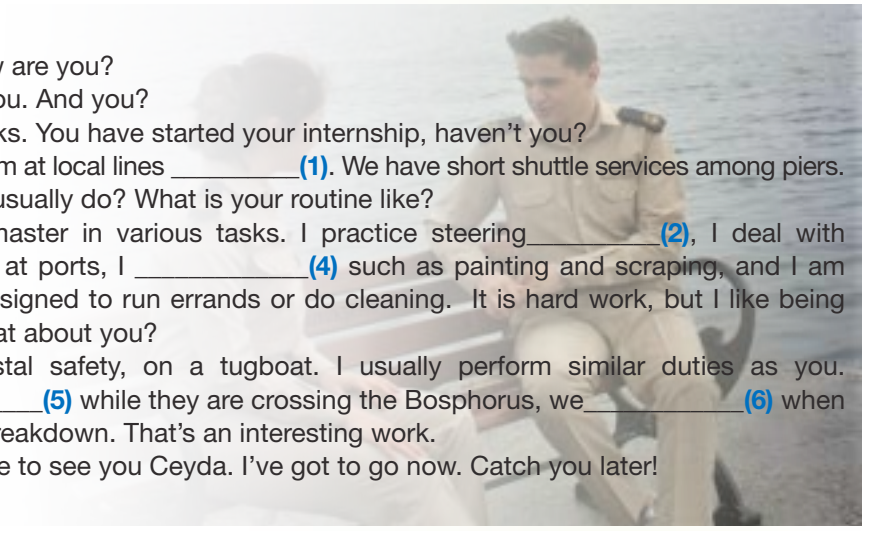
OFFICER	WATCHKEEPING TIME INTERVALS FOR DECK OFFICERS					
	0000-0400	0400-0800	0800-1200	1200-1600	1600-2000	2000-0000
1_____		X			X	
2_____	X			X		
3_____			X			X

IV. SPEAKING AND WRITING

Two cadets encounter and talk about their vessels.

A Read the dialogue to complete it with the phrases in the box.

tow vessels during navigation	**I work on a ferry**	**mooring operations**
	practice maintenance work	**escort large ships**



İlhami: Hi Ceyda!
Ceyda: Hi İlhami! How are you?
İlhami: Fine. Thank you. And you?
Ceyda: I am fine thanks. You have started your internship, haven't you?
İlhami: Yes, I have. I am at local lines _____**(1)**. We have short shuttle services among piers.
Ceyda: What do you usually do? What is your routine like?
İlhami: I assist the master in various tasks. I practice steering_____**(2)**, I deal with _____**(3)** at ports, I _____**(4)** such as painting and scraping, and I am sometimes assigned to run errands or do cleaning. It is hard work, but I like being onboard. What about you?
Ceyda: I am at coastal safety, on a tugboat. I usually perform similar duties as you. We_____**(5)** while they are crossing the Bosphorus, we_____**(6)** when they have a breakdown. That's an interesting work.
İlhami: Great! It is nice to see you Ceyda. I've got to go now. Catch you later!
Ceyda: See you.

B Practice the conversation in pairs changing the vessel types and tasks.

2 ENGINE CREW

I. LEAD IN

The Engine Department is responsible for keeping the vessel's machinery operational and maintained. They repair and maintain engines, propulsion system, pumps, winches, electrical power supply system, fuel oil system and technological devices such as freshwater generators, fuel treatment and garbage incineration systems. The Engine Department consists of marine engineers and ratings.

Discuss your answers to the following questions with your classmates.

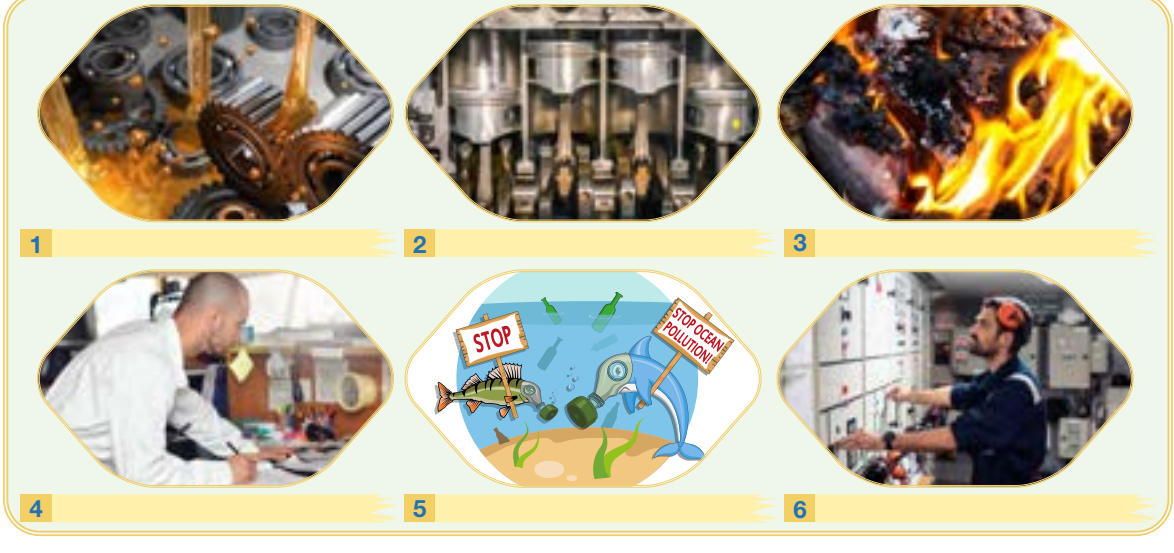
1 Do you know who is the head of the engine department?
2 What can be the general duties of the engine department onboard?

II. VOCABULARY

A Match the halves to form meaningful phrases.

1	electrical power ____	a	prevention
2	garbage ____	b	oil
3	condensate ____	c	components
4	sewage __i__	d	records
5	lubricating ____	e	incineration
6	log book ____	f	system
7	routine ____	g	engine
8	moving ____	h	supply
9	auxiliary ____	i	treatment
10	pollution ____	j	control

B Write one phrase from Exercise A under each photo.



1 2 3 4 5 6

III. READING

Oiler	Chief Engineer	Third Engineer	Electro-technical Rating	Able Seafarer Engine
Donkeyman	Engine Cadet	Fourth Engineer	Second Engineer	Electro-technical Officer

A Read the text about the duties of engineers and engine ratings and write the correct ranks.



The _____ **(1)** (C/E) is in charge of overseeing the operations of the whole machinery to ensure a safe voyage. Her/his duties include making sure that the engine crew apply the routine maintenance complying with the Planned Maintenance System, guiding them to deal with emergency situations, checking the condition of engine room equipment, checking the log book records for pollution prevention systems, fuel, lubricating and waste oil regularly. S/he reports to the master.

The _____ **(2)** (2/E), is the second person in charge of daily maintenance and operational activities in the engine department. During the day, s/he keeps watch in the engine room and supervises the proper operation of the engine room machinery, and reports to the chief engineer.

The _____ **(3)** (3/E) is generally responsible for the operation of auxiliary engines, boilers, fuel, feed, and condensate systems. S/he reports to the second engineer.

The _____ **(4)** (4/E) keeps daily watches in the engine department and is generally responsible for electrical equipment, sewage treatment, lubricating oil, waste oil and bilge. S/he also reports to the second engineer.

The _____ **(5)** (E/C) is required to observe, comprehend, and practice the operations of the engine department while assisting the engineers. S/he reports to the second engineer.

The _____ **(6)** (ETO) is responsible for the operation, maintenance and repairs of all electronic fittings, switchboards, electrical motors, batteries, fire detectors, alarm system, air-conditioning system, navigational equipment, refrigeration unit and refrigerated containers. S/he has to be prepared for electrical emergencies and must know how to act in emergency situations. S/he reports to the chief engineer.

An _____ **(7)** (ETR) assists ETO in testing, maintaining, and repairing all electrical and electronic systems and equipment within the vessel. S/he has to know how to work with electrical appliances safely.

The _____ **(8)**, like the bosun in the deck department, assigns the duties to the engine ratings and manages and supervises the work in the engine room. S/he also takes care of the stocks and the equipment in the engine room and does the routine control of bilge and bilge pumps. S/he reports to the second engineer.

An _____ **(9)** (ASE), is, an experienced and qualified rating in the engine room. S/he might be assigned to do a variety of duties such as contributing to maintenance and repairs of the main propulsion and auxiliary machinery, taking part in fuel, oil transfer, bilge, and ballast operations, handling the stores and cleaning the tools and equipment in the engine room and working with electrical equipment. S/he needs to know safety and pollution prevention rules.

An _____ **(10)** is responsible for lubricating moving components, checking the oil level cleaning and maintaining the engine room and assisting the engineers in the maintenance of the machinery.

B Read the text in Exercise A on Page 51 again and answer the questions.

1 How many engineers are there in the engine department? Who are they?
2 What does an ETO do on board?
3 What do a bosun and a donkeyman have in common?
4 Who is in charge of the engine department on board?
5 Who has a higher rank; an ASE or a donkeyman?

IV. SPEAKING Discuss your answer to the following question. Share your view with your classmates.

Do you want to work in the engine department? Why? / Why not?
e.g., *No, I don't. Because it might be too noisy to work in the engine room.*

V. WRITING Complete the sentences using the information in the text on Page 51.

1 The Engine department is responsible for _____
2 The Chief Engineer supervises the work of _____
3 An ETO must know how to _____
4 An ETR _____in maintaining and repairing electrical-electronic systems.
5 An oiler _____ moving components of the machinery.

VI. LEARN THIS

When we talk about obligations and responsibilities we use **"have/has to, must/mustn't, can't"**; but when we want to express the lack of obligation we use **"don't/doesn't have to"**.

Re-write the sentences as in the example below.

e.g., *A welder is obliged to get the necessary licence to work on board.*
A welder has to get the necessary licence to work on board.

1 Officers are required to have a lot of qualifications.
Officers_____. (must)
2 They will not accept any crew on board under 18 years old.
You_____to be a crew member on board. (have to)
3 You don't need to gain a lot of qualifications to be a rating.
You_____. (not have to)
4 It is essential for the master to know English very well.
The master_____. (must)
5 A cadet is required to follow the orders of the officers.
A cadet_____. (have to)

3 CATERING CREW

I. LEAD IN

Catering Department is in charge of preparing and serving the meals and housekeeping work on board.

Discus your answer to the following question with your classmates.

Do you know what the catering crew does on board?

II. READING

Read the text about the catering crew and write TRUE/FALSE for the sentences below. Correct the false information.

Catering crew might vary according to the type and the size of the vessel. For instance, there is usually more catering personnel on a passenger ship than cargo carriers, and there are fewer crew members on a small or medium-sized cargo vessel than larger ones.

On passenger ships or larger cargo vessels with more catering crew, there is a specific hierarchy among the crew like other departments. However, generally, a cook and a steward handle the catering on a conventional cargo vessel. The **cook** is responsible for preparing the menu, cooking, keeping the galley maintained and clean, ordering and storage of galley supplies.



The steward is in charge of domestic work of the vessel including cleaning the living quarters of the officers, ordering and storage of domestic provisions. S/he also assists the cook for preparing and serving the meals, cleaning the provision stores and the galley.

1 Catering crew consists of the same crew members in every commercial ship. _____

2 Keeping the galley clean is among the responsibilities of the cook. _____

3 Steward usually involves in service of the food and drinks. _____

4 The cook helps the steward to clean the officer's rooms. _____

III. WRITING

A Write 3 duties for each catering crew below.

Steward	
Cook	

1C CREW ORGANISATION

B Write a paragraph telling which department and rank you would like to work onboard. Give details, explain your reasons.

ABBREVIATIONS Write the long forms of abbreviations.

1 C/O _____
2 C/E _____
3 2/O _____
4 2/E _____
5 3/O _____
6 3/E _____
7 4/E _____
8 D/C _____
9 E/C _____
10 A/B _____
11 ASE _____
12 O/S _____
13 ETO _____
14 ETR _____
15 STCW _____

PROJECT Visit a ship in groups and interview with at least three crew members (both officers and ratings) and ask them about their responsibilities, working hours, working conditions, salary etc. Then, translate the interview into English and prepare a presentation introducing the people you interviewed to the class.

SELF ASSESSMENT 1	1	2	3
1 I can tell the names of basic vessel types in English.			
2 I can recognize a vessel when I see it.			
3 I can tell the main parts of a ship in English.			
4 I can tell the main structural elements of a ship in English.			
5 I can tell the names of the crew in different departments of a ship in English.			
6 I can talk about the duties of crew members.			

REVISION 1

A Complete the sentences with the given information.

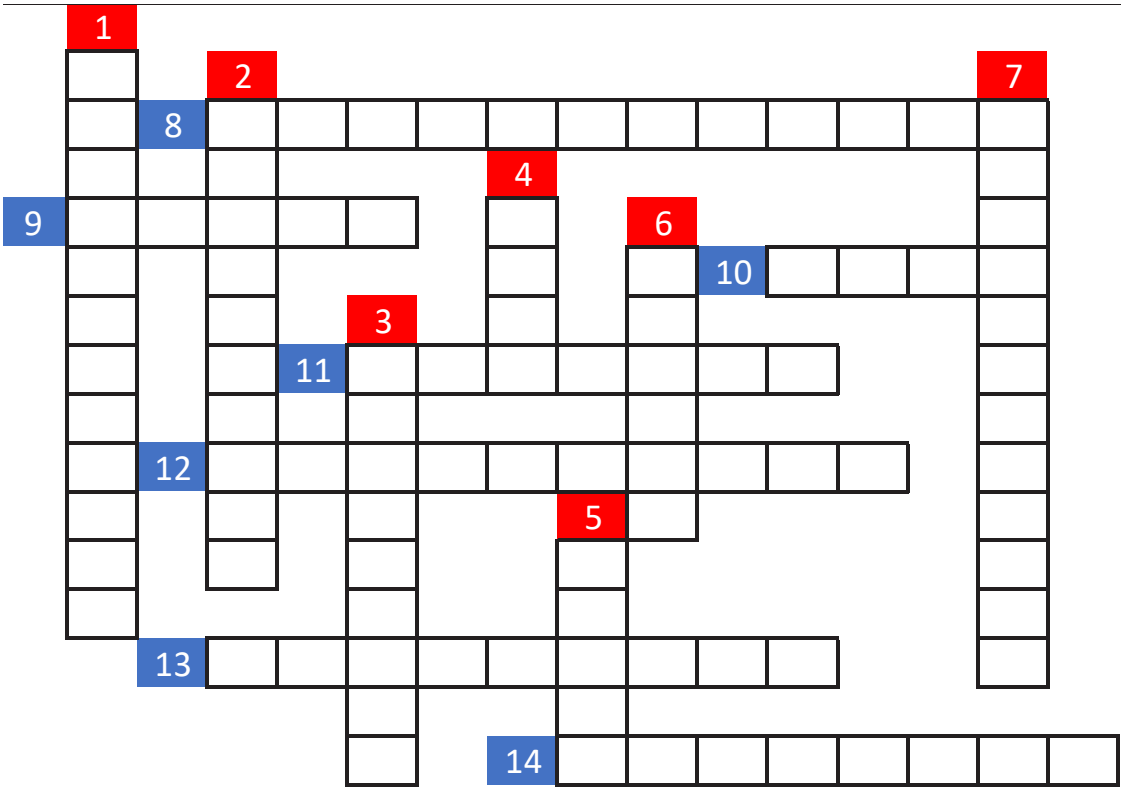
carry dangerous chemicals for marine life	**by its spherical tanks**
the cargo can be floated in using the ballast water	**have refrigerated cargo holds**
roll the vehicles on and off easily	**load and discharge their cargo in ports**

1 Reefers _____ to carry their cargo unspoiled.
2 Containers need large cranes in order to _____.
3 Chemical Tankers, _____; therefore, their tanks should be insulated very well.
4 Ro-Ros have ramps in order to_____.
5 _____ while loading a semi-submersible heavy-lift cargo carrier.
6 You can recognise an LNG/LPG carrier _____.

B Choose the correct word or phrases in bold.

1 The outer plating of the vessel is called **hull/shell plating.**
2 **Beams/Bulkheads** divide the vessel into watertight sections.
3 Frames and beams are connected via **brackets/bulbous bow.**
4 **The hull/The keel** is the main body of the vessel.
5 Frames are placed **athwart/lengthwise.**
6 The keel extends **from bow to stern/from starboard to port.**
7 **Bulbous bow/Keel** is built to reduce drag and increase stability of the vessel.

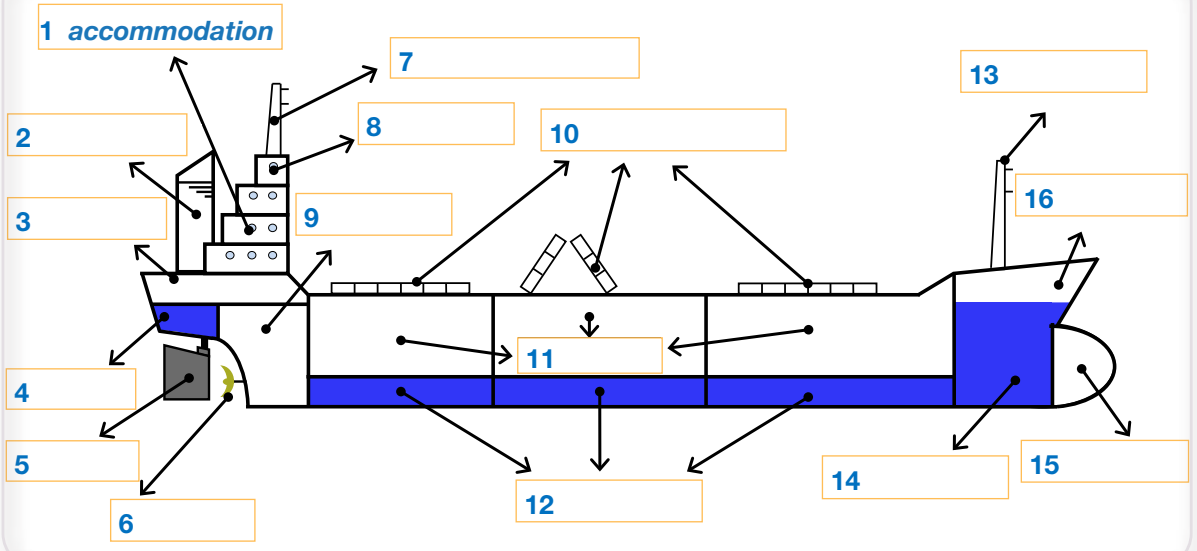
C Read the definitions and complete the puzzle.



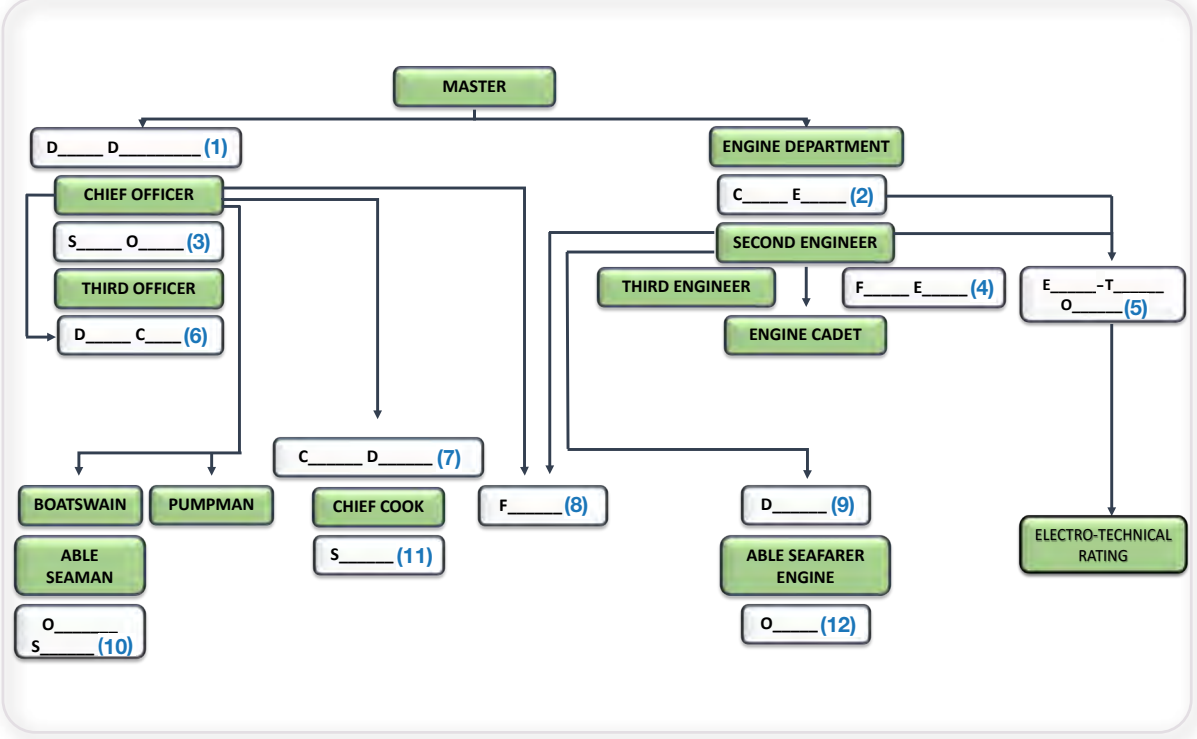
1 Two watertight layers at the bottom of the vessel
2 A bulb-like extension at the bow of the vessel
3 Watertight walls dividing the vessel into sections
4 The main body of the vessel
5 Transverse structural elements connected to top ends of frames
6 They are the transverse strengthening elements connected to the keel like ribs
7 The outer skin of the vessel which is made of steel
8 They are at the bottom of the vessel and contain water to support the stability of the vessel
9 It is an enclosed space at the bottom of the vessel where the wastewater is contained
10 It is the backbone of the vessel
11 It is the railing fitted around the sides of the deck
12 They are fin-like plates at the sides of the vessel to reduce rolling
13 They are at the bow and the stern, and they contain ballast water and fresh water
14 Seawater is taken and contained in it

D Write a word from the box for each parts indicated on the picture of a vessel.

forecastle deck	forepeak tank	cargo holds	main mast	rudder	
~~accommodation~~	aft peak tank	engine room	ballast tanks	funnel	bridge
fore/head mast	bulbous bow	hatch covers	poop deck	propeller	



E Complete the crew diagram.



F Choose the correct item.

1 _____ are designed to carry various types of cargoes.

A Ferries B Freighters
C Dredgers D Seiners

2 _____ and _____ transport hazardous cargoes.

A Livestock carriers/reefers
B Container ships/bulkers
C Chemical tankers/gas tankers
D Crude oil tankers/product tankers

3 _____ are specially designed to open the way for other vessels in ice-covered water.

A Icebreakers B Trawlers
C Ro-Ros D Cable layers

4 Cruise ships are used for _____.

A provision supply
B vehicle transportation
C catching pelagic species
D pleasure trips

5 _____ are used to catch fish on longliners.

A Seine nets B Baited hooks
C Purse nets D Trawling nets

6 _____ is the rear end of the vessel.

A Port B Amidships
C Stern D Bow

7 Starboard is the _____ of the vessel.

A rear part B left side
C front part D right side

8 The anchor is used to _____ the vessel.

A moor B steer
C load the cargo on D support the stability of

9 The _____ is the horizontal cylinder which is used to pull up/lower down the anchor and heavy weights.

A crane B rudder
C capstan D windlass

10 The _____ is the room where the vessel is controlled and navigated.

A engine room B bridge
C galley D accommodation

11 _____ is the maximum weight that a vessel can carry.

A Draught B Gross tonnage
C Displacement D Deadweight

12 _____ is responsible for life-saving equipment on a ship.

A The chief engineer
B The second officer
C The third officer
D The second engineer

13 The _____ is the head of deck ratings and is responsible for the work of deck department.

A boatswain B donkeyman
C deck cadet D third officer

14 The _____ is the rating who is responsible for lubricating moving parts of the machinery.

A fitter B pumpman
C oiler D cook

15 The _____ is responsible for housekeeping work and involves in preparation and service of the meals.

A able seaman
B steward
C electro-technical rating
D engine cadet



2 MARITIME SAFETY AND EMERGENCIES

In this unit, you will...

- get familiar with navigational hazards and occupational risks on board.
- talk about marine accidents and actions to be taken in emergencies.
- recognise life-saving appliances and fire-fighting equipment.
- learn the meanings of basic emergency signs and distress signals.
- review common diseases, injuries, and symptoms.
- talk about first aid actions taken in certain medical emergencies.

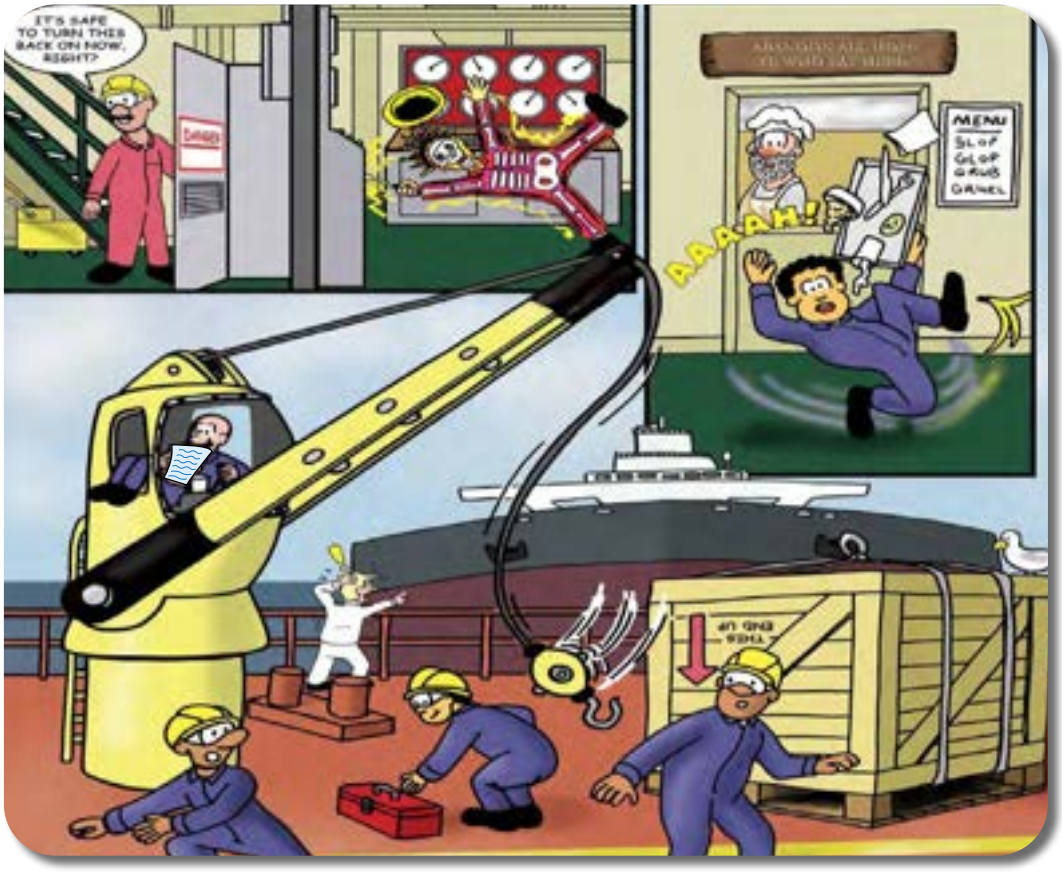
2A SHIPBOARD WORK SAFETY

INTRODUCTION

I. LEAD IN Safety is the most crucial concern when transporting cargo and/or passengers by sea since it might involve various risks. It is essential to take all necessary actions before and during navigation to eliminate the risks for severe injuries, fatality, substantial damages to the vessel or its cargo and possible harms to marine environment.

Discuss the answers to the following questions with your classmates.

1 What kind of operations might involve risks on board?
2 What kind of precautions can be taken to eliminate risks and to safe working?



II. SPEAKING AND WRITING

A Discuss the answers to the following questions.

1 What kind of accidents can you see in the cartoon above?
2 What are the reasons for those accidents?

B Write three things that seafarers must do to prevent these kind of accidents.

_____
_____
_____

III. READING AND WRITING

A Read the text and fill in the gaps with the given words.

officer	walkie-talkie	permit-to-work	checklist	injuries
protective	accompanied	meetings	risk	procedures

HOW TO WORK SAFE ON BOARD

Each work requires specific precautions depending on its nature and risks involved. To eliminate the risks for work-related accidents, _____ **(1)**, or loss of life resulted from them, all required precautions must be taken before, during and after the operations.

In order to maintain shipboard work safety, some basic actions mustn't be skipped. First of all, personal _____ **(2)** equipment (PPE) must be in good condition. To ensure this, the maintenance must be carried out regularly. The crew must also get training for using the PPE properly and they must follow the _____ **(3)** precisely. The working space must be cleaned and tidied after each work. Equipment must also be cleaned and stowed away properly. Continuous training of crew members and frequent safety_____ **(4),** which increase the awareness of the crew, are also essential for working safety.

Some operations (e.g., working aloft, welding, working in confined spaces) involve higher risks; therefore, additional _____ **(5)** assessment and _____ **(6)** procedure for authorisation may be required for them. In such circumstances, the crew can be asked to fill in a form and fill out a _____ **(7)** to ensure that they are informed about the risks and liable to take all necessary safety precautions. An _____ **(8)** is usually in charge of observing and supervising this type of operations. Additionally, a crew member should not work alone in high-risk operations. S/he must be _____ **(9)** by at least one person who can help or call for help in case of an unexpected situation. If a crew member has to work alone in high-risk spaces, s/he has to keep in contact with someone outside via a _____ **(10)**.

These are some of the basic precautions that must be taken while working on board; however, each work must be assessed individually taking all factors (e.g., authorisation, weather conditions) into consideration.

B Read the text again and write three of the precautions for occupational safety with your own words.

e.g., *The crew members must wear appropriate PPE.*

1 _____
2 _____
3 _____

IV. VOCABULARY

Read the definitions of the words taken from the text above and complete them.

1	very important and necessary	e__ s__ __ __ __ __ l
2	to include	i__ __ __ __ v __
3	to demand or necessitate for something	r__q__ __ __ __
4	to remove or get rid of something unwanted	e__ __ __ __ n __ __e
5	to attend or go to along with someone to assist	ac __ __ __ p __ __ y
6	to guarantee	e__ __u __e
7	knowledge or understanding of a situation or fact	a__ __ __e__ __ss
8	official permission	a__ t __ __ __ __ s __t__ __ __
9	the act of evaluating all information about something	a__ __ __ ss__ __ nt
10	actions taken to keep good condition of something	m__ __ __t __ __ __ nc__

2A SHIPBOARD WORK SAFETY

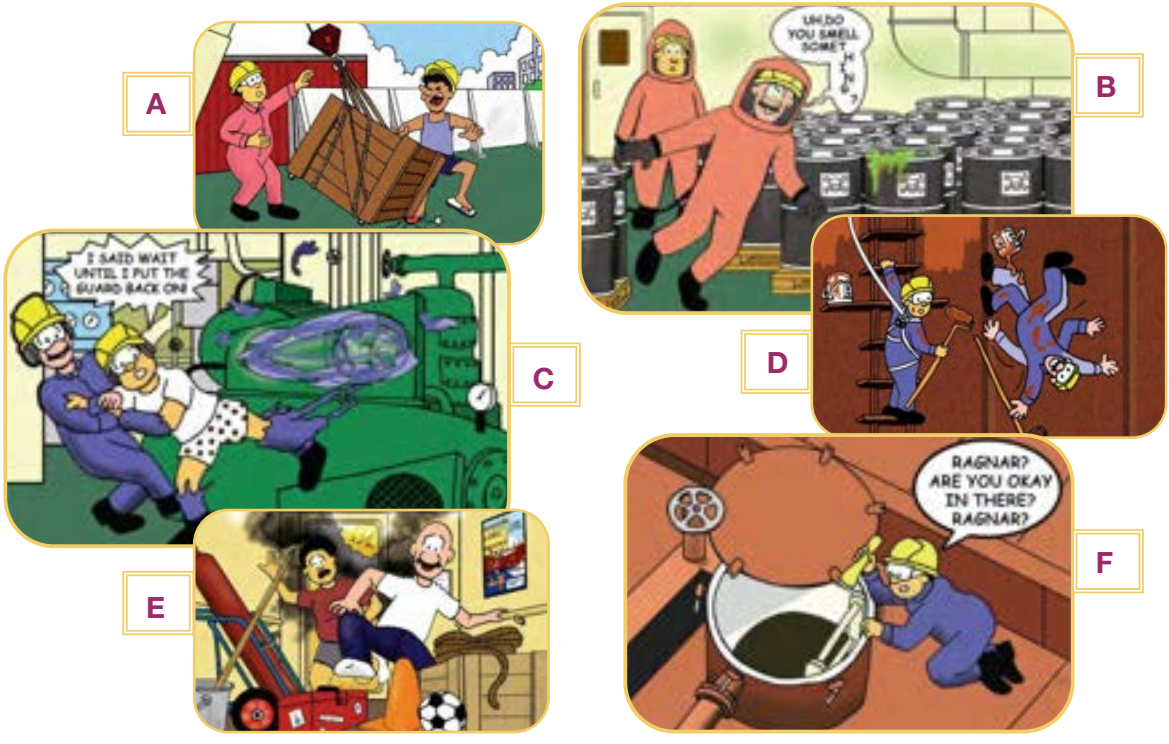
1 OCCUPATIONAL ACCIDENTS AND RISK FACTORS

I. LEAD IN Discuss the answer to the following question.

What kind of human errors may cause occupational accidents on board?

II. READING

A Look at the cartoons below. Tell what type of accidents or disorders are shown, and what the reasons are.



B Match the pictures with the sentences or paragraphs describing what happened.

1 The crew member has entered in a confined space without measuring the atmosphere for oxygen and gas content; so, he has probably fainted because of asphyxiation. Not following the procedures is main cause of this accident. _____

2 It is a type of tripping accident. Two crew members are trying to escape from fire, but one of them has tripped because of poor housekeeping. _____

3 The crew member is getting poisoned by noxious chemicals because his chemical suit hasn't been maintained properly. _____

4 A box has fallen on a crew member's feet and smashed his toe since he hasn't worn his protective shoes and he has been standing under a lifted load. _____

5 The overalls of the crew member have entangled in the machinery as he didn't follow the instructions well. _____

6 One of the crew members who has been painting the cargo hold has fallen from the height due to not wearing a safety harness. _____

III. VOCABULARY

A Match the words with the pictures.

1 bruise ___	2 bollard ___	3 checklist ___	4 asphyxiation ___	5 drowning ___
6 slipping ___	7 electrical shock ___		8 fracture ___	9 entangling ___



B Match the halves, and then complete sentences using six of the collocations.

1 permit-to-	____	poisoned
2 hearing	____	chemicals
3 electrical	____	limb
4 getting	____	sparks
5 noxious	____	zone
6 loss of	____	shifting
7 snap-back	____	a breakdown
8 cargo	____	shock
9 emit	____	work
10 having	____	disorders

A Even if you lose a finger or a toe, _____ can affect your psychology badly.

B Safety precautions on a tanker ship is essential since they usually carry _____.

C Welding machine can _____; so, you must protect your eyes.

D _____ is the part of the mooring area where you are in the risk of getting injured by the impact of the mooring ropes.

E Listening to loud music all the time can cause serious _____.

F If the cargo is not stowed properly, a sudden turn of a vessel can cause _____ which is dangerous since moving load can injure the crew and damage the vessel, as well.

C Complete the sentences with given words.

slippery	**confined**	**safety**	**sharp**	**falling**

1 I have a claustrophobia; so I can't work in _____ spaces.
2 _____ tools must be kept out of reach of children since they may cut themselves.
3 _____ objects can cause head injuries. Wear your helmet!
4 Don't step in! The floor is wet and _____. I have just washed it.
5 Have you taken all necessary _____ measures before starting the work?

2A SHIPBOARD WORK SAFETY

IV. WRITING AND SPEAKING

A Work in pairs. Write the risk factors in working on board under the photos.

Working in confined spaces	Embarking/Disembarking	Wet/Slippery decks
Cleaning and maintenance operations	Working aloft	Bunkering/Oil work
Working with electrical machines/devices	Welding/Flame Cutting	Handling cargo
Mooring operation	~~Handling sharp tools~~	Handling chemicals
Working near running machinery	Working with/near hot objects	Excessive noise



1 _____



2 _____



3 _____



4 _____



5 _____



6 _____



7 _____



8 _____



9 _____



10 _____



11 _____



12 *Handling sharp tools*



13 _____



14 _____



15 _____

B In groups, discuss the answers to the questions according to Exercise A on Page 64.

1 What kind of accidents or injuries may occur when working in the places in Exercise A?
2 What precautions can you take to protect yourself from being injured?
3 What kind of PPE do you have to wear during the operations in Exercise A?

e.g., *We can cut ourselves while working with sharp objects. The cuts can be deep, and we can be injured seriously. We must wear special gloves and we must take the sharp tools away when we finish our work.*

C Work in pairs. Complete the table with the given information.

Hearing disorders or hearing loss
Working near running machinery
Oil spills, eye injuries, skin irritation and fire
Cranes, winches, hatches, cargo holds and cargo tanks
~~Falling from the height, having bruise and fractures~~ ***1***
Asphyxiation, gas poisoning, getting stuck and having bruises
Welding/Flame cutting
Chemical cargo tanks
Wet/Slippery floors
Mooring operation
Electrical shock and fire

Risk Factors	Working Spaces/Equipment	Possible Accidents, Injuries or Damage
Working aloft	Masts, funnel, cranes, hatch openings	**1** *Falling from the height, having bruises and fractures*
2	Decks, galley floors, engine room floors	Slipping and falling, having bruises and fractures
Working in confined spaces	Oil, ballast, freshwater, and sewage tanks, cargo holds, chain lockers, boilers, cofferdams, engine crankcases	**3**
Handling Cargo	**4**	Falling objects, cargo shifting, having bruises and fractures
5	Windlass/capstan, bollard, anchor chain and ropes	Snap-back zone, tripping, entangling, having fractures and bruises
Working with electrical machines/devices	Accommodation, decks, bridge room, engine room, engine control room, mooring areas, cranes, masts	**6**
Bunkering/Oil Work	Oil tanks, pipelines, pumps	**7**
8	Main machinery and auxiliary machinery	Entangling, impacts, crushing, having cuts, loss of limb (fingers, arms, legs, etc.)
Handling Chemicals	**9**	Chemical spills, marine pollution, getting poisoned, eye injuries and skin irritation
10	Ship's board, decks, engine room, mooring areas, cranes, funnel, masts and holds	Emitting sparks, causing fire, eye and face injuries
Being exposed to excessive noise	Machinery, auxiliary machinery (ventilation equipment, generators, winches, cargo machinery)	**11**

V. READING AND WRITING

A Read the article below and choose the correct title for it.

- Falling from height after cargo hold cleaning.
- Fatal strike by tow line.
- Crew member fatality during deck maintenance.

(IMO, Lessons Learned from Marine Casualties, III 5/15, Annex 1, 20)

What happened?

A container ship was unberthing and the ship's mooring line was paid out from the ship's aft mooring deck to the tug which was waiting below. When the line was secured, the tug pulled away causing the line to come under tension suddenly. The mooring line jumped out from the bitts on the aft mooring deck and hit a seafarer, who was standing nearby, in the chest, fatally injuring him.

B Complete the sentences with the words from the box to form collocations.

ineffective	unfamiliar	risk	snap-back	adequate	seafarer

Why did it happen?

- The seafarer was standing in the _____ **(1)** zone.
- The _____ **(2)** was not adequately supervised.
- No _____ **(3)** assessment had been conducted to ensure _____ **(4)** precautions were in place.
- There was _____ **(5)** communication between the tug and the ship.
- The officer in charge was_____ **(6)** with using a ship's mooring rope as the towline.

C Write the lessons that we can learn from the event in the text. (Use must/ mustn't)

What can we learn?

e.g., *The officers must be familiar with the equipment used in the operations.*

1 _____
2 _____
3 _____
4 _____

D Read the story of the accident again and answer the questions.

1 What was the type of the ship that the seafarer was working on?
2 Which operation was taking place when the accident happened?
3 What was the seafarer doing when the accident happened?
4 What type of an accident occurred?
5 Was the seafarer injured severely?
6 What caused the accident?

2 SAFETY PRECAUTIONS AND PERSONAL PROTECTIVE EQUIPMENT

I. LEAD IN

Main reasons for occupational accidents are not wearing PPE, not maintaining PPE, not following the procedures and not tidying up the working area after the work.

Discuss the answers to the following questions.

1 Do you know what kind of PPE are used on board?

2 Why do you think it is important to wear/use PPE while working?

II. READING

Work in pairs. Read the precautions that must be taken for safe working on a vessel and write the risk factors that you have learned in the previous exercises.

1 ***Cargo Handling***
- Wear a safety helmet, high visibility clothing and safety shoes.
- Have someone to accompany you on deck during loading/ discharching operations.
- Don't stand or walk under lifted loads.





2 _____
- Warning signs must be placed.
- You must wear earmuffs/ear plugs.

3 _____
- Wear a chemical suit, SCBA (Self-contained Breathing Apparatus), rubber gloves, goggles and safety shoes.
- Don't inhale the substance and avoid direct contact.
- Check containers for leakage frequently. If there is a leakage, stop the operation.





4 _____
- Wear a mask, goggles, safety shoes and gloves.
- Don't inhale paint or cleaning solvent; ventilate enclosed areas while working.
- Put paints, solvents and tools away when the work is finished.

2A SHIPBOARD WORK SAFETY

5 _____

- Don't touch the objects with bare hands; wear heat-resistant gloves.
- You must protect your face from flames, hot steam etc.
- Don't leave hot utensils unattended in the galley area.





6 _____

- Permit-to-work is required.
- Ventilate the space before entering. Check for oxygen and gas content continuously.
- Someone must wait outside, and you must keep in contact with the outside via a walkie-talkie.
- Don't stay in very long.

7 _____

- Maintain and test mooring equipment frequently.
- Clear the mooring area from ropes and equipment when they are not in use.
- The crew must be aware of snap-back zone.





8 _____

- Warning signs must be placed.
- Wear non-slip safety shoes/boots.
- Clean the areas from oil, ice, rubbish etc.

9 _____

- Permit-to-work is required.
- Wear a safety harness with a lifeline and a safety helmet.
- Inform the engine room when working on the funnel.
- Inform the bridge room when working on the main mast.





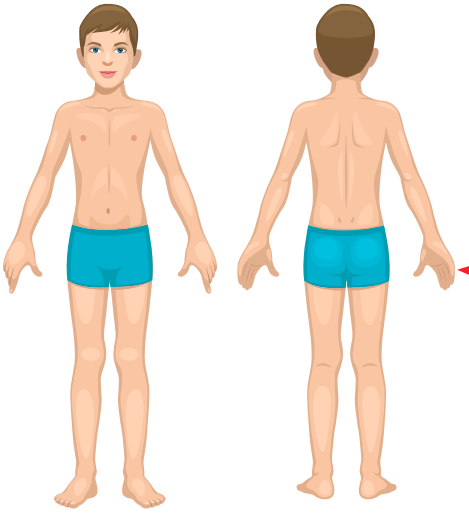
10 _____

- Use the gangway or accommodation ladder; don't use portable ladders unless you have to.
- A safety net must be rigged.
- Hold the handrails with one hand.

III. VOCABULARY

A Draw lines to show the body parts on the picture.

hair
eye
nose
mouth
chin
chest
arm
stomach
knee
foot



head
ear
neck
shoulder
elbow
back
wrist
hand
leg
ankle

B Match the PPE with the pictures.

1 Goggles ___
2 Safety Shoes ___
3 Earmuffs and Ear Plugs ___
4 Walkie-talkie ___
5 High Visibility Clothing ___
6 Chemical Suit ___
7 Face Mask ___
8 Respirator ___
9 Safety Helmet ___
10 Hair Net ___
11 Safety Harness ___
12 Gloves ___
13 Protective Clothing (Overalls) ___
14 Welding Shield ___
15 SCBA ___



IV. SPEAKING AND WRITING

A **Work in groups. Discuss where or for what purpose we use the PPE in the pictures on Page 69.**

e.g., *We can use a **hair net** when working near running machinery, because there is a risk of entanglement. If we wear a hair net, we protect our hair from entangling in the machinery parts.*

B **Complete the sentences with the words for PPE or Body Parts on Page 69.**

1 _____ protect your ears from high levels of machinery sounds.
2 Goggles protect your _____ from dust particles, chemicals, sparks etc.
3 A _____ protects your face and eyes from sparks.
4 A _____ protects you from inhaling dust particles and non-toxic fumes.
5 A safety helmet protects your _____ from falling objects and impacts.
6 Safety gloves protect your _____ from chemicals, sharp or hot objects.
7 A _____ holds and protects you from falling from the heights.
8 _____ protect your feet against impacts or penetrations.
9 A chemical suit protects your whole _____ when dealing with chemicals.
10 A _____ helps you to communicate with the responsible person outside.

V. LEARN THIS

We use **must** to talk about something that is necessary or mandatory to do, and **mustn't** when we think or know it is not true to do.

e.g., *You **must** wear PPE all the time you work on board.*
*You **mustn't** smoke in a place where there are combustibles.*

Chose the correct options for the sentences below.

1 A seafarer **must/mustn't** enter a confined space before the atmosphere is checked.
2 Welding **must/mustn't** be operated by an unauthorized person.
3 Safety helmet **must/mustn't** be worn during cargo operations.
4 You **must/mustn't** wear safety shoes while working on the deck.
5 You **must/mustn't** work on the masts without wearing a safety harness.
6 Permit-to-work **must/mustn't** be used for working aloft.

ABBREVIATIONS

Write the long forms of abbreviations.

1 **PPE** _____
2 **SCBA** _____

PROJECT Visit a ship and observe the shipboard work being carried out. Take notes (and photos or videos if you can) about safety issues (e.g., using PPE properly, following safety procedures, tidying up the working area after the work). Prepare a report about it.

2B EMERGENCY SITUATIONS AND MEASURES

INTRODUCTION

I. LEAD IN Discuss the answers to the following questions. Share your views.

1 What kind of emergencies might occur on board?

2 What actions can be taken to minimise serious injuries due to marine accidents?



II. READING AND VOCABULARY

A Read the text and complete it with the correct words from the box.

life-saving	procedures	fire-fighting	accident	messages	weather

In case of a marine _____(1) that occurs due to several factors such as bad _____(2) conditions, misuse of equipment, emergency _____(3) and **first aid** must be applied immediately. **Distress signals** and _____(4) must also be sent when necessary. Crew members must know **emergency escape routes**, the shortest ways to the closest **muster station**, the location of_____(5) appliances (LSA) and _____(6) equipment (FFE) on board. Each crew member must understand standard safety, warning and **emergency signs** and be aware of her/his duties written on the **muster list** very well. For this reason, the crew must get a proper training, attend regular meetings, and practice **emergency drills** frequently.

B Write the highlighted collocations from the text next to their definitions below.

1 _____: practices of procedures to be applied in case of an emergency
2 _____: a list of tasks for each crew member to fulfil in an emergency
3 _____: predetermined paths to be followed for a safe evacuation in case of an emergency
4 _____: signals which are sent by a vessel when it is in danger
5 _____: a place where the crew and the passengers gather in emergency
6 _____: an immediate basic care given to an ill/injured person before the arrival of medical services
7 _____: the signs placed or hanged on various departments of the vessel to guide you in emergency situations

2B EMERGENCY SITUATIONS AND MEASURES

III. LEARN THIS

We use **past simple** to talk about finished actions, events or conditions in the past.

e.g., *Two old fellows **sat** beside the fire and **talked** about the old days.*
*They **didn't realize** the time.*
*What **did** they **talk** about?*

We use **past progressive** to talk about actions or events in progress at a certain time in the past. We also use it for an interrupted action or event by another using **when** or **while.**

e.g., *We didn't hear the phone. We **were watching** a match at 7 p.m.*
*While I **was walking** in the park, I heard a screech of brakes.*
*Sorry, I **wasn't listening**. What did you say?*
*What **were** you **talking** about when I came in this morning?*

A Complete the sentences using while or when.

1 _____ I was waiting for the bus, it began to rain.
2 _____ I went out, it was snowing.
3 I was studying _____ the telephone rang.
4 I saw her _____ she was crying.
5 _____ he came, I was eating my lunch.

B Complete the sentences with the correct past form.

1 While we_____ (go) out, it _____ (begin) to rain.
2 When the door-bell _____ (ring), I _____ (have) a shower last night.
3 What _____ you_____ (do) at eleven o'clock on Sunday morning?
4 I _____ (see) an accident while _____ (go) home yesterday afternoon.
5 When I _____ (arrive) at school this morning, my friends _____ (play) basketball in the garden.

C Write the sentences using past continuous with while or when.

e.g., *The ship / unberth / a seafarerer / fall into / sea*
The ship was unberthing when a seafarer fell into the sea.

1 the tanker / discharge / its cargo / the fire / start
_____. (when)
2 what / the master / do / the / collision / happen
_____? (when)
3 the mooring line / hit / the seafarer / the ship / moor
_____. (while)
4 the cargo / shift / the ship / manoeuvre
_____. (while)
5 the / cook / not pay attention / the plate / catch fire
_____. (when)

1 MARINE ACCIDENTS AND LIFE-SAVING APPLIANCES

I. LEAD IN

In addition to individual injuries due to misuse of PPE, not following safety procedures or lack of training, a vessel is likely to face various marine accidents and emergencies which affect the whole vessel adversely.

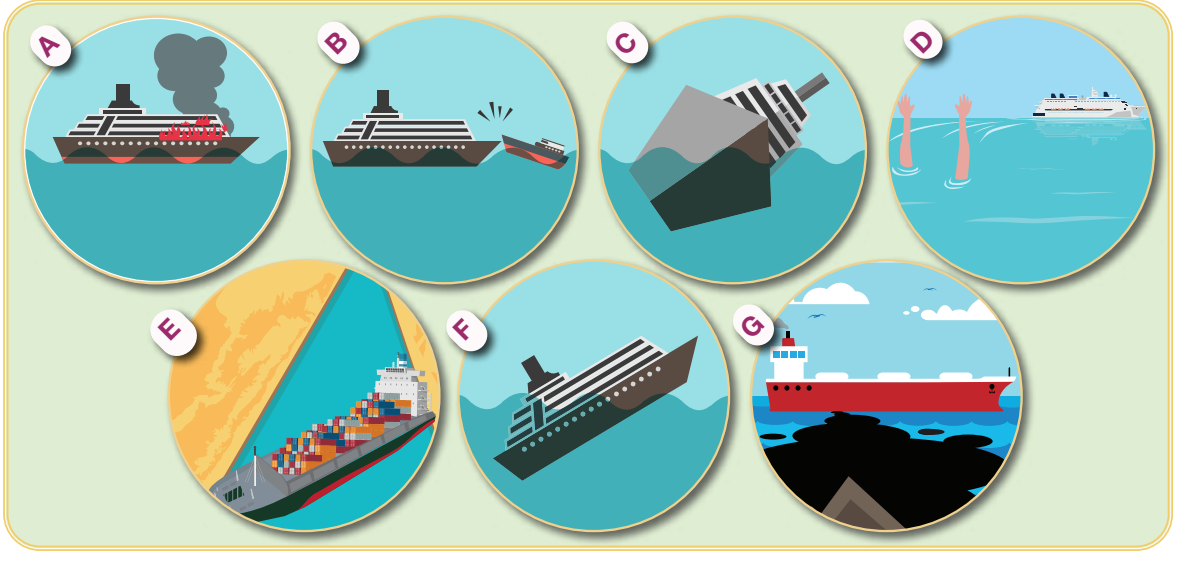
Discuss the answers to the following questions in class.

1. Do you know what marine accidents are?
2. Which life-saving appliances can be used in certain accidents?
3. What kind of signs can be placed on a vessel to be helpful in emergencies?

II. VOCABULARY

A Match the names of the marine accidents with their pictures.

1 collision ___	**3 listing** ___	**5 fire on board** ___	**7 sinking** ___
2 grounding ___	**4 oil spill** ___	**6 man overboard** ___	



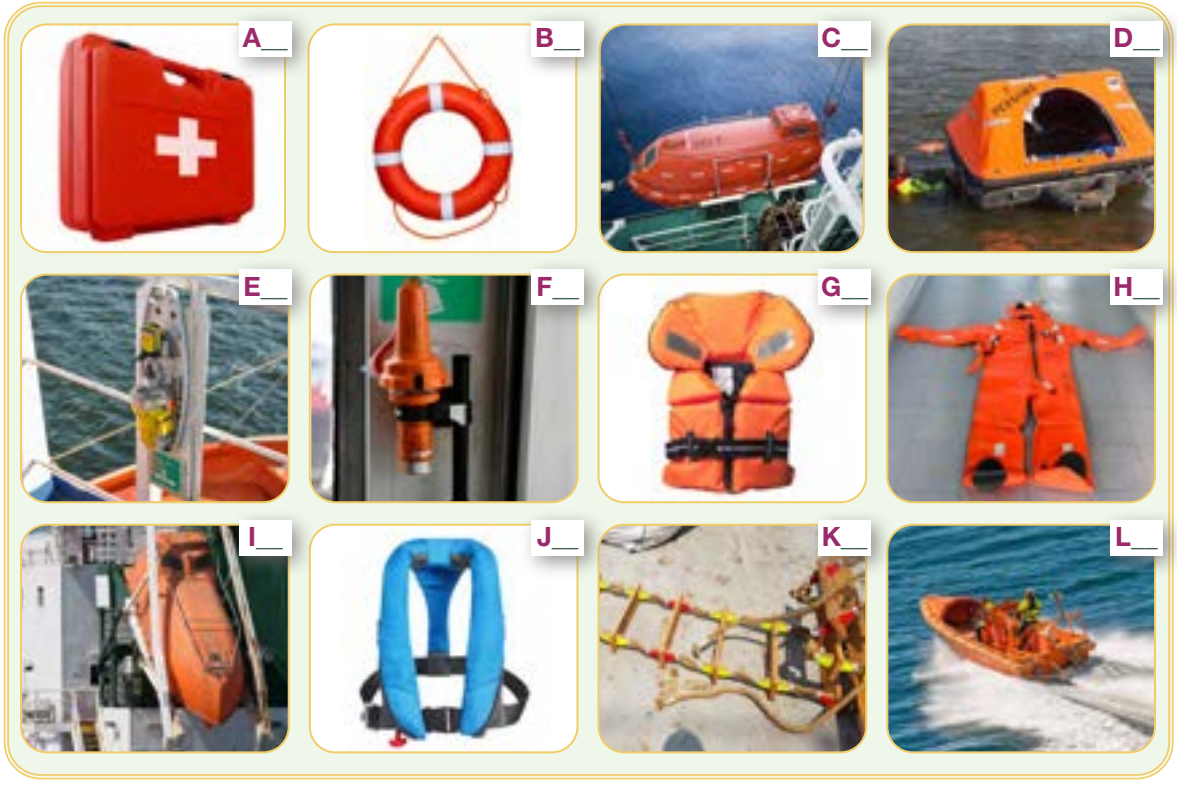
B Complete the sentences with the appropriate types of accidents given in Exercise A.

1. _____ is the type of marine accident in which a person falls overboard.
2. The crash or impact between two vessels which cause damage is called _____.
3. _____ is the leakage of oil from the vessel's tanks, and it causes marine pollution.
4. The vessel leans one side due to unstable stowage of cargo, bad weather or a collision during the marine accident called _____.
5. _____ is the marine accident that refers to the impact on the vessel's bottom by the seabed or a shallow rock.
6. _____ is the accident in which surfaces or equipment on a vessel catches fire and burns.
7. _____ means going down to the sea-bottom due to flooding.

2B EMERGENCY SITUATIONS AND MEASURES

C Match the LSA with their pictures.

1 Search and Rescue Radar Transponder (SART)
2 Emergency Position Indicating Radio Beacon (EPIRB)
3 Inflatable life jacket
4 Embarkation ladder
5 Life jacket
6 Lifeboat
7 First aid kit
8 Liferaft
9 Immersion suit
10 Rescue boat
11 Lifebuoy
12 Free-fall lifeboat



III. SPEAKING AND WRITING

A Discuss in pairs when you need LSA; then write sentences as in the example.

e.g., *We need first aid kit when we are injured or when we have a heath problem.*

B Write the correct LSA to complete the sentences.

1 You must wear a/an _____ to protect your body from cold water.
2 A/An _____ keeps you afloat when you cannot swim.
3 You must lower down a/an _____ when you see a person overboard.
4 We need a/an _____ when we are injured or need an immediate medical assistance.
5 In emergencies, _____ is activated to send distress signal to the shore.
6 A/An_____ and a/an_____ are used to abandon the vessel in emergencies.

C Write three LSA that you have learned for the categories on the table.

Survival Crafts	Personal LSA
e.g., *Free-fall lifeboat*	***e.g.,*** *Lifebuoy*

IV. READING Read the actions taken in case of marine accidents on the right and write the numbers of the marine accidents on the left next to the actions.

1 MAN OVERBOARD

2 COLLISION

3 LISTING

4 FIRE ON BOARD

5 OIL SPILL

6 GENERAL EMERGENCY

Contain and clean up the spill immediately. ___

Sound the fire alarm. ___

Drop a lifebuoy with light and smoke signal. ___

Wear firefighter's outfit. ___

Close the valves and stop the leakage. ___

Start a Williamson Turn manoeuvre. ___

Detect the collision angle. ___

Run out fire hoses. ___

Transfer water between heeling tanks. ___

Use oil spill kit. ___

Go to muster station. ___

Jettison or transfer the cargo from the heeling side. ___

Call the master immediately. ___

Contact with the vessel that has been collided into. ___

Sound the emergency alarm. ___

Detect the heel angle. ___

V. SPEAKING AND VOCABULARY

A Write the correct number of the signs on the pictures next to their meaning.

___ fire extinguisher	___ lifted load hazard	___ no smoking	___ line throwing appliance
___ lifeboat	___ rocket parachute flare	___ emergency exit	___ wear safety harness
___ first aid	___ fire alarm call point	___ hot work prohibited	___ no unauthorised entry
___ stretcher	___ wear protective clothing	___ explosion hazard	___ environmental hazard
___ muster station	___ wear welding shield	___ slippery surface	___ survival craft distress signal
___ fire blanket ___ fire hose reel	___ Emergency Escape Breathing Device (EEBD)	___ Search and Rescue Radar Transponder (SART)	___ Emergency Position Indicating Radio Beacon (EPIRB)



B Choose one of the signs. Describe it to your partner in order that s/he can guess which sign you are talking about. Swap the teller and the guesser and repeat it.

e.g., Student A: *It is a warning sign. When you see this sign, you must be careful about lifted loads.You mustn't stand under the lifted load.*

Student B: *It is number 8.*

Student A: *Correct! It is your turn.*

Student B: *Okay. This sign shows you the location of the first aid. You can access immediate medical care when someone is injured with the help of this sign.*

Student A: *It is number 3.*

Student B: *No. It is not correct. Be careful! I said first aid.*

2 FIRE AND FIRE-FIGHTING EQUIPMENT

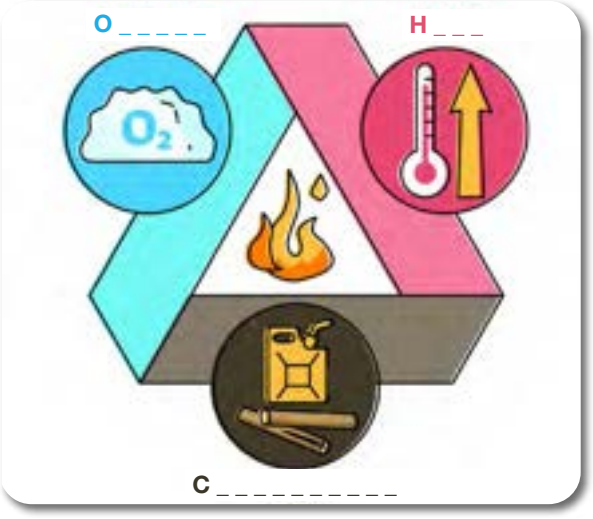
I. LEAD IN Discuss the following questions.



1 What factors can cause fires on board?
2 Do you know what FFE includes?
3 Do you know how to extinguish different types of fires?

II. VOCABULARY

A You see the fire triangle on the pictures below. Write the elements causing fire on the picture. First letters are written for you.



B1 Look at the photos and study the fire-fighting equipment (FFE). Then match the photos with the phrases in the box in Exercise B2 on on Page 78.



2B EMERGENCY SITUATIONS AND MEASURES

B2 Write the names of FFE to complete sentences.



____ Fire Extinguisher
____ Firefighter's Outfit
____ Fire Hydrant
____ Fire Blanket
____ EEBD
____ Fire Alarm Button
____ Fixed CO_2 Fire Extinguishing System
____ Fire Hose

1 A _____ is a fireproof clothing which protects the firefighter's whole body from flames.
2 A _____ is a kind of non-flammable cloth which is helpful in smothering small fires in the galley by preventing the oxygen flow in.
3 A _____ consists of a valve and a coupling for hose connection. It is used to release water from the water supply to extinguish fire.
4 An _____ consists of a mask and a small oxygen container. It provides 10-15 minutes oxygen for the wearer while escaping the area where it is dangerous to inhale the smoke, gas, or fumes.
5 A _____ is used to sound the alarm to let the crew know that there is a fire.
6 A _____ is used to put out fires by spraying water, foam, dry chemical powder or CO_2 on the flames.
7 _____ is used to release CO_2 in the atmosphere and reduce the oxygen. This application eases extinguishing fires.
8 A _____ is a high-pressured type of hose which is used to transfer water from the fire hydrant to the area on fire. It is kept in a special box on board.

III. SPEAKING AND WRITING

A Read the conversation formed with SMCP (Standard Marine Communication Phrases) between a vessel and the shore and write the questions in the dialogue.

The Coastguard: _____? **(1)**
OOW: Fire is in the second cargo hold.
The Coastguard: _____? **(2)**
OOW: No, dangerous goods are not on fire.
The Coastguard: _____? **(3)**
OOW: No danger of explosion.
The Coastguard: _____? **(4)**
OOW: No, fire is not under control.
The Coastguard: _____? **(5)**
OOW: I require fire-fighting assistance.
The Coastguard: Report injured persons.
OOW: Number of injured persons: two.

B Practice the dialogue with your partner. Swap the roles and repeat it.

C Change the information in the dialogue and write a similar conversation for different types of accidents in pairs.

D Study the table and say what kind of fire extinguisher can be used for the given types of fires.

e.g., *We can use all extinguishers to put out A-Type fires.*



A WOOD, PAPER, FABRICS, ETC.	✓	✓	✓	✓
B FLAMMABLE LIQUIDS	✗	✓	✓	✓
C FLAMMABLE GAS	✗	✓	✓	✗
D METAL ALLOYS	✗	✓	✗	✗
F COOKING OIL, FATS	✗	✓	✓	✗

2B EMERGENCY SITUATIONS AND MEASURES

IV. READING

A Read the article and complete the sentences with the past forms of the verbs in parenthesis.

Fire after Spill of Highly Flammable Cargo Causing Multiple Injury and People Reported Missing
(IMO, Lessons Learned English, FSI 19, Number 6)

What happened?

An about 4,000 GT chemical tanker in port _____(1) (discharge) highly flammable cargo when some of it _____ (2) (leak) on deck. The leaked cargo_____ (3) (cannot) be contained because there_____ (4) (be) also an overflow of ballast water on deck. It _____ (5) (spill) over the ship's side and it was ignited by a launch moored alongside. The launch _____ (6) (catch) fire and drifted away. The fire _____ (7) (spread) to the chemical tanker before it was controlled by the ship's crew and a port tug. Several crew members of the launch and the chemical tanker_____ (8) (suffer) injuries. Three crew members on the launch were reported missing.

Why did it happen?

- Crew without proper training and experience in chemical tanker operations resulted in non-compliance with safety regulations.
- Officers involved lacked competence in critical chemical tanker operations and carried out uncontrolled port operations.
- Insufficient onboard pre-planning and communication of procedures between personnel involved in port operations inhibited the detection and control of deviations from procedures during port operations.

B Complete the table using the information in the text.

1 Type of the vessel	
2 Feature of its cargo	
3 Accident type	
4 Other vessels involved	
5 Casualties	

C Read the second part of the text related to the reasons of the accident again and complete the sentences with a word.

1 The _____ were not trained well.
2 The _____ were inexperienced in chemical tanker operations.
3 The_____ in charge were incompetent in critical operations on chemical tankers.
4 The_____ between the crew members was insufficient.
5 The _____ was not planned well in advance.

ABBREVIATIONS

Write the missing words in the abbreviations below.

SART : Search and Rescue Radar_____ (1)
EPIRB : Emergency_____ (2) Indicating Radio _____ (3)
EEBD : Emergency_____ (4) _____ (5) Device
LSA : _____ (6) Appliances
FFE : _____ (7) Equipment
PPE : Personal P_____ (8) E_____ (9)
SCBA : Self-contained B_____ (10) Device

PROJECT Attend/observe an emergency drill; take photos or video-record the actions taken during the drill and prepare a presentation giving details of procedures in groups.

2C MEDICAL EMERGENCIES AND FIRST AID

INTRODUCTION

I. LEAD IN

First aid is the immediate medical care that is given to a person who has a sudden health problem or is injured in an accident. First aid must be applied by a person who is trained for it and can make critical assesments quickly and correctly.

Discuss the answers to the following questions. Share your experiences and views.

1 Do you know how to carry out first aid? Have you got any training for it?
2 In what situations is first aid neccessary?



II. VOCABULARY

A Complete the sentences with the words or phrases related to first aid.

cardiopulmonary resuscitation (CPR)			casualty	fatal	carotid arteries
recovery position	consciousness	breathing	airway	pulse	compression

1 Major blood vessels in the neck that supply blood to the head are called _____.
2 _____ is inhaling air into your lungs and exhaling it regularly.
3 _____ is the state of being awake and aware of oneself and environment.
4 Applying pressure on something to reduce its volume is called _____.
5 A _____ is someone who is injured or killed in an accident.
6 If something (e.g., accident, injury) is _____, it means that it can result in death.
7 _____ is the feeling of regular heart-beat on arteries.
8 The way that air passes through during breathing is called _____.
9 _____ is the position that unconcious casualties are lied on one side, face downwards during first aid which keeps the airway open and they can continue breathing.
10 _____ is a lifesaving first aid technique in which mouth-to-mouth resuscitation and chest compression are applied together to supply oxygen and circulation to a casualty/patient.

2C MEDICAL EMERGENCIES AND FIRST AID

B Look at the picture of the first aid kit and write the number of the objects in it from the list.



FIRST AID KIT

___ Plasters	___ Gauze pads
___ instant cold pack	___ Triangular bandage
___ Scissors	___ Pocket mask
___ Antiseptic wipes	___ Eye drops
___ Tweezers	___ Adhesive tape
___ Safety pins	___ Thermometer
___ Antibiotic ointment	___ Hydrocortisone cream
___ Aspirin	___ First aid emergency manual
___ Medical gloves	___ Gauze bandage

III. SPEAKING AND WRITING

A Work in groups. Discuss what the items in the first aid kit are used for and in what ways they are used.

e.g., *A thermometer is used to measure the temperature. It tells us whether a person has fever or not.*

B Write your answers in items and read aloud in the classroom. Correct false information (if there is any) in other groups' lists. Check your mistakes (if there are any).

1 FIRST AID BASICS

I. LEAD IN Discuss the answers to the following questions.

1 What do you think things to be considered are when applying first aid?

2 Do you know what kind of injuries are mostly encountered on board?



II. READING AND WRITING

A Read the basic rules of first aid and match them with the detailed explanations.

____ **A** You must check the accident scene very carefully for a life-threatening danger for the casualty and yourself before beginning the first aid.

____ **B** If you are alone with the casualty or the patient, call for help. In any case,call for professional medical services even if you apply the first aid right.

____ **C** You must assess where the best place is for the first aid. You must decide whether it is better to carry out the first aid at site or somewhere else like an ambulance or a hospital.

____ **D** Before moving the casualty, you must check for fractures which might be fatal as the casualty is moved. It is better not to move the casualty unless the accident scene is dangerous to stay.

1 Request support
2 Don't move the casualty
3 Who to help first
4 Risk assessment
5 Where to apply
6 Don't give food

____ **E** Never give something to eat to a casualty or a patient as it might cause choking.

____ **F** When there are more than one casualties, a reasonable assessment must be done to decide who is more urgent to get the first aid or who is more likely to benefit from the first aid.

2C MEDICAL EMERGENCIES AND FIRST AID

B1 Before applying first aid, you must first check the consciousness of the casualty/patient. AVPU Scale is used to check the consciousness level.

Complete the words indicating conciousness levels on AVPU scale. Some of the letters written for you.

A	A_ _ rt	
V	V_ _ b _ l	
P	P _ _n	
U	Unr_ _ p _n_ _ve	

B2 Write the definitions of conciousness levels on the AVPU Scale above.

1 The casualty/patient does not open his/her eyes when you call her/his name. S/he is hard to wake up. In other words, s/he does not respond to verbal stimuli. S/he only responds to pain if you pinch.

2 The casualty/patient is totally unconcious. S/he does not respond to you in anyway.

3 The casuallty/patient is wholly awake, and s/he can ask questions and respond to your questions meaningfully.

4 The casualty/patient can respond to verbal stimuli. S/he seems asleep when s/he is not asked questions or called by her/his name.

C Work in pairs. Match the first aid techniques with the purposes below.

1 Ask questions like the name and the date of birth
2 Call the name of the casualty loudly
3 Pinch the casualty
4 Check the mouth using your fingers
5 Tilt the head and lift the chin
6 Look-feel-listen
7 Check the pulse
8 Apply CPR
9 Give recovery position

__5__ **A** to prevent the airway from being blocked by the casualty's tongue.
_____ **B** to find out whether there is circulation or not.
_____ **C** to keep the airway open.
_____ **D** to check whether s/he is responsive to pain or not.
_____ **E** to check whether the casualty is wholly alert or not.
_____ **F** to give oxygen and recover the circulation of the casualty.
_____ **G** to check whether the casualty is breathing or not.
_____ **H** to check whether s/he is responsive to verbal stimuli or not.
_____ **I** to remove if there is an object that may block the airway.

2 FIRST AID FOR INJURIES AND MEDICAL EMERGENCIES

I. LEAD IN Discuss the following questions.

1 What do you think the most common injuries on board are?
2 What kind of first aid can be given to treat those injuries?
3 What other medical emergencies are likely to occur during navigation?

II. VOCABULARY

A Work in pairs. Match the pictures with the symtoms or injuries.

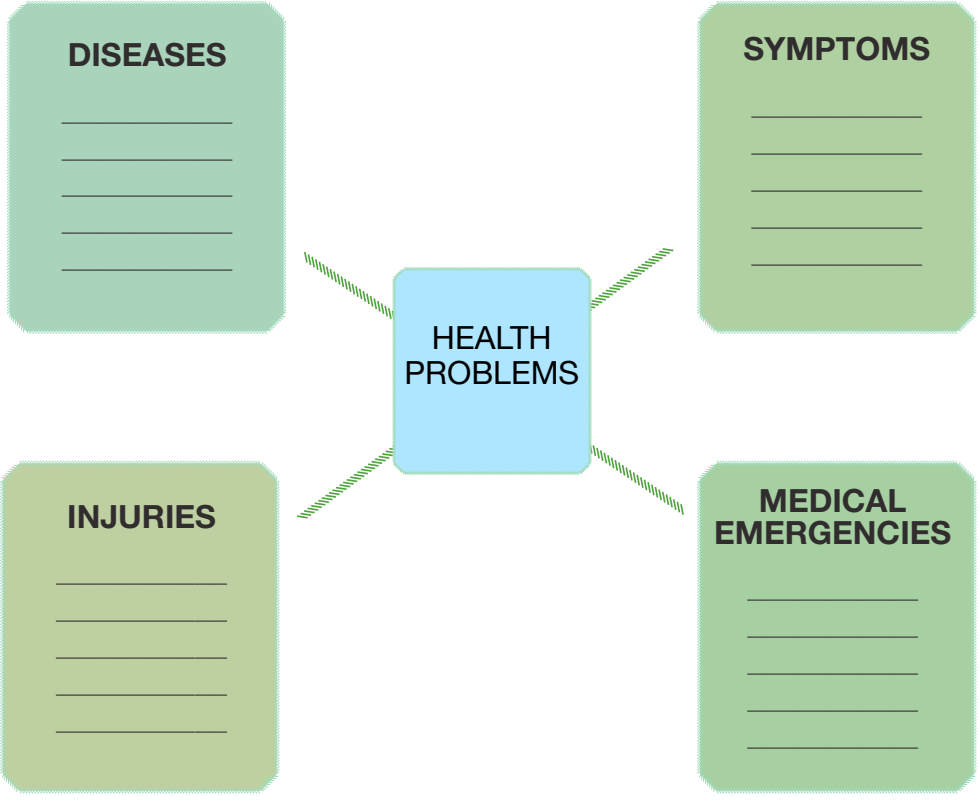


- ☐ shortness of breath
- ☐ fatigue
- ☐ fainting
- ☐ nausea
- ☐ runny nose
- ☐ headache
- ☐ burn
- ☐ bleeding
- ☐ sprain
- ☐ animal bite
- ☐ vomiting
- ☐ cut
- ☐ backache
- ☐ heat stroke
- ☐ fever
- ☐ sore throat
- ☐ chest pain
- ☐ cough
- ☐ stomachache
- ☐ choking

2C MEDICAL EMERGENCIES AND FIRST AID

B Work in pairs. Put the health problems in the correct box according to their category.

1 sprain	5 diabetes	9 fainting	13 fracture	17 cut
2 heart attack	6 drowning	10 ulcer	14 hypothermia	18 pneumonia
3 burn	7 nausea	11 heartburn	15 getting poisoned	19 fever
4 common cold	8 hepatitis	12 bruise	16 chest pain	20 stomachache



C Complete the sentences with the correct word from the box.

fever	animal bite	stomachache	cut	asphyxiation	cough	bleeding	disease

1 Common symptoms of Covid-19, which is a viral_____, are fever, fatigue, dry _____and aches in the muscles.

2 You have shortness of breath during _____.

3 You have to stop _____ immediately when you have a deep_____.

4 You often have a _____if you have an ulcer.

5 If your _____ is more than 37°C, it means that there is something wrong with you.

6 _____can be fatal since it might be infectious. Some animals are poisonous as well.

III. WRITING Write the type of injuries or medical emergencies from the box to complete the sentences.



1 You need to apply head-tilt/chin-lift manoeuvre to open the airway and start mouth-to-mouth resuscitation to give first aid in the event of ***drowning***.

2 You must remove wet clothes immediately and wrap the casualty with a dry blanket who suffers from _____ to keep her/him warm.

3 Severe chest pain is the distinctive symptom of _____. Loosening tight clothes and chewing aspirin are among the first aid actions for it.

4 If the patient has symptoms like headache, nausea, fatigue and dizziness, it means that s/he is suffering from _____. Take her/him out of the space immediately, check the airway and provide oxygen using oxygen mask.

5 If the injury is a minor_____, you may keep the area in cold water and give the injured person a painkiller.

6 If your ankle has swelled and you feel pain there, you have probably _____ it.

7 Don't move the casualty, immobilise and wrap the area when there is a _____.

8 The person has cramps, fatigue and dizziness if s/he is suffering from _____.

9 To stop bleeding you have to apply compression on the _____.

10 You must give 5 back blows first; and then perform 5 Heimlich Maneuvre when you give first aid to a person suffering from _____.

PROJECT Work in groups. Prepare a first aid scene for a kind of medical emergency, equipment and a dialogue about it. Role-play the scene in the classroom.

SELF ASSESSMENT 2	1	2	3
1 I can talk about PPE and the type of work they are used on board.			
2 I can talk about the risks involved in working on board.			
3 I can talk about marine accidents and emergency situations on board.			
4 I can tell some of the emergency actions in English.			
5 I can read and interpret some basic emergency signs.			
6 I can tell the names of fire-fighting equipment in English.			
7 I can talk about fire types and extinguishers in English.			
8 I can tell what there are in a first aid kit in English.			
9 I can tell common injuries and medical emergencies on board.			
10 I can talk about the basics of first aid in emergency situations.			

REVISION 2

A Match the halves to form collocations.

1 Muster_____	a stroke
2 Fire_____	b position
3 Recovery _____	c station
4 Distress_____	d bandage
5 Confined_____	e blanket
6 Man_____	f zone
7 Fatal_____	g message
8 Cargo_____	h injury
9 Snap-back_____	i overboard
10 Occupational_____	j space
11 Heat _____	k shift
12 Triangular_____	l safety

B Odd one out.

1 safety harness	goggles	earmuffs	liferaft
2 toothache	diabetes	runny nose	fever
3 rope snap-back	collision	grounding	listing
4 pain	airway	verbal	alert
5 safety pin	immersion suit	rescue boat	lifebuoy
6 foam	water	fuel oil	dry powder

C Choose the correct item.

1 _____ is a necessary procedure for authorisation in high risk operations.

- A Consciousness test
- B Permit-to-work
- C Cargo jettison
- D Heimlich Maneuver

2 Snap-back zone is the dangerous area during _____ operations.

- A cargo-handling
- B mooring
- C embarking
- D maintenance

3 _____ is a risk faced while working next to the running machinery.

- A Cargo shifting
- B Asphyxiation
- C Entanglement
- D Skin irritation

4 _____ must be cleaned at once since it is a danger for marine life and it causes marine pollution.

- A Oil spill
- B Sewage water
- C Grain residues
- D Paint brushes

5 Falling from the heights can be prevented by wearing _____.

- A goggles
- B safety shoes
- C a SCBA
- D a safety harness

6 Welding-shields protect your eyes from _____ during welding.

- A chemicals
- B sparks
- C dust
- D salt

7 Distress signals are sent when there is a/an _____ on board.

- A drill
- B fight
- C pilot
- D emergency

8 You have to go to the _____ immediately when there is an emergency.

- A bridge
- B engine room
- C muster station
- D accommodation

9 _____ is the marine accident when a ship leans its one side.

A Collision **B** Grounding
C Sinking **D** Listing

10 You must use a lifeboat or a liferaft when you need to _____ in emergencies.

A rescue someone overboard
B abandon the ship
C apply first aid to someone
D jump into the water

11 _____ is NOT used to extinguish flammable liquids.

A Water **B** CO_2
C Dry powder **D** Foam

12 _____ is NOT one of the elements in the fire triangle that cause fire.

A CO_2 **B** Combustibles
C O_2 **D** Heat

13 Instant cold pack can be helpful in _____ .

A cuts **B** bleeding
C choking **D** fractures

14 _____ is NOT one of the basic rules of firs aid.

A Request support
B Don't move the casualty
C Don't give food to the casualty
D Give some water to the casualty

15 Excessive noise can cause _____ .

A hearing disorders
B major breakdowns
C asphyxiation
D cargo shifting

16 You have to inform the bridge before working _____.

A on the slippery surface
B on the main mast
C at the mooring area
D in the galley

17 You must check the oxygen and gas content before working _____.

A on the crane
B at the outboard
C in a confined space
D on the funnel

18 _____ is NOT a precaution for safety on board.

A Training the crew
B Practicing regular drills
C Wearing PPE
D Working in bad weather conditions

19 _____ is NOT an injury. It is a kind of symptom.

A Bruise **B** Fracture
C Fainting **D** Burn

20 _____ is an illness.

A Burn **B** Hypothermia
C Ulcer **D** Heat stroke



3

MARITIME LAW AND MANAGEMENT

In this unit, you will...

- get familiar with basic terms for maritime law
- talk about maritime zones and rights of the states on them
- recognise basic maritime conventions and their scope
- have basic information about the surveys for ships
- talk about commercial and technical management of ships
- recognise the types of charter parties in maritime
- tell the abbreviations and use of incoterms in maritime
- get familiar with the terms used in maritime record books
- recognise the types of record books and their usage
- get familiar with the ship certifications
- tell the names of cargo and port documents

3A MARITIME LAW AND CONVENTIONS

INTRODUCTION

I. LEAD IN

Maritime law is the international body of laws to which all coastal states and vessels are liable. Maritime law regulates rights and responsibilities in lots of issues including transportation of goods and passengers, safety, security, marine environment, labour, and registrations of ships through conventions.

Discuss the answers to the following questions. Share your views.

1 Do you think a special law for maritime is necessary? Why? / Why not?

2 Do you know any conventions related to maritime? What are they?

II. READING

A Read the paragraphs below and match the notions with the paragraphs.

☐ "All problems of ocean space are closely interrelated and need to be addressed as a whole."

☐ "Safe, secure, and efficient shipping on clean oceans!"

1 THE INTERNATIONAL MARITIME ORGANISATION (IMO)

IMO, which was established in 1948, is an agency of the United Nations and currently has 174 member states and three associate members. The purpose of the organisation is to ensure acceptable standards for many aspects of international navigation and shipping through conventions. There are three main categories of IMO conventions: maritime safety, prevention of marine pollution, liability and compensation. Other conventions are concerned with various matters including (but not limited to) unlawful acts, marine traffic and tonnage measurement.

2 THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA (UNCLOS)

UNCLOS is an international convention which was adopted in 1982. More than 150 countries have signed in it, and they represent all regions of the world. It consists of 320 articles and nine annexes which regulate several issues related to water areas in the world including the rights and jurisdiction of the states over the oceans and the seas, economic activities and scientific research of these states in specific water zones, and environmental liabilities.

B Read the paragraphs again and write TRUE or FALSE for the sentences.

1 IMO is an organisation, but UNCLOS is not. _____

2 UNCLOS was signed before IMO was established. _____

3 IMO is highly concerned with safety and pollution. _____

4 UNCLOS was signed by more than 320 states. _____

5 UNCLOS has nothing related to maritime law in it. _____

6 IMO has adopted a convention to facilitate marine traffic. _____

III. VOCABULARY

A Match the terms in the box with their definitions.

nautical mile ____	**1** a group of islands
convention ____	**2** the work which is carried out by spending an (especially physical) effort
innocent ____	**3** a narrow passage through the land connecting two seas/oceans
valid *10*	**4** the official authority to make legal decisions
strait ____	**5** a set of rules, social or cultural or norms
jurisdiction ____	**6** a unit equal to 1.852 kilometres and used to measure a distance at sea
coastal state ____	**7** an addition or an attachment to something bigger
unlawful ____	**8** an agreement signed between states on a particular subject
labour ____	**9** without guilt, moral fault, or sin
regime ____	**10** designated by a legitimate authority, or in proper ways
annex ____	**11** a state of a country which has a coast
archipelago ____	**12** illegal, not appropriate to the law

B Match the terms related to maritime law with their definitions.

1 Ship Registration
2 Classification Society
3 Nationality of a Ship
4 Flag State
5 Port of Registry

a ____ is the state which has jurisdiction and liability on the vessels under its flag.
b ____ is the national identity of a vessel which is given by the flag state that she is registered to.
c ____ is the act of giving a national identity to a ship by giving it an official number.
d ____ is the port where the ship is registered.
e ____ is an organisation which classify the vessels according to certain standards in building and operation of the vessels.

3A MARITIME LAW AND CONVENTIONS

IV. LEARN THIS

We add specific suffixes at the end of verbs or adjectives to form nouns. We call them **noun suffixes**. Most commonly used noun suffixes are **'-tion/-ion, -ity, -ry, -it, -ment, -ship'**

A Study the adjectives, verbs and their noun forms with your partner. Write the required form on the table. Look the words up in your dictionaries if you need.

NOUN FORMS	VERB/ADJECTIVE FORMS	REQUIRED FORM
1	pass	noun
liability	2	adjective
registry	3	verb
4	national	noun
5	be bound	noun
pursuit	6	verb
7	violate	noun
sovereignty	8	adjective
9	regulate	noun
compensation	10	verb
11	authorised	noun
suspicion	12	adjective
13	suppress	noun
classification	14	verb
15	amend	noun

B Choose the correct word from the table in Exercise A to complete the sentences.

1 Each state is _____ to provide food, shelter, education and medical care for its citizens.

2 The _____ of cargo vessels are usually made according to the cargo that they transport.

3 "_____unconditionally belongs to the nation" is famous quotation from M. K. Atatürk.

4 You must _____ your dreams decisively if you want to achieve what you want.

5 They will probably want us to pay a fortune in order to _____ for the damage we caused.

6 You must fill in this form and sign it in order to _____.

7 We need to do some _____ on the contract before we sign it. It does not include all of our conditions.

8 The _____ has to be drawn well in order to maintain order and peace.

1 MARITIME ZONES AND PASSAGE RIGHTS

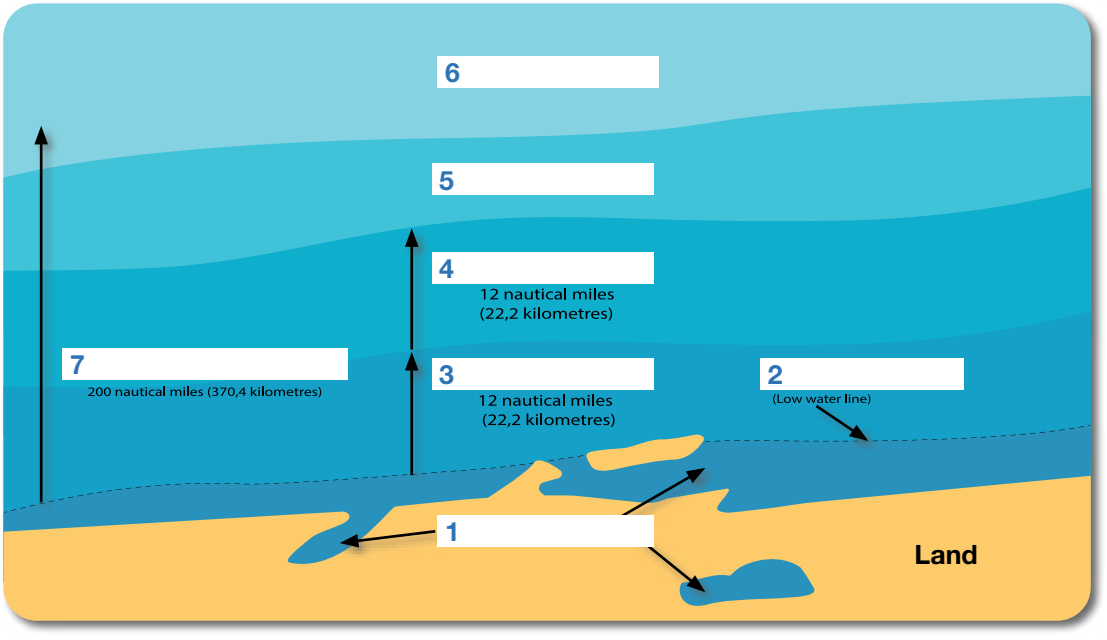
I. LEAD IN Discuss the answers to the following questions with your classmates.

1 Why do you think seas are divided into zones?

2 Do you know anything about passage rights for the seas or straits in Türkiye?

II. READING AND WRITING

A Read the sentences about maritime zones specified in UNCLOS and write the names of them on the picture.



Internal Waters: It is a term used for the water areas within the baseline of a coastal state, or inland waters of a state such as bays, lakes, or rivers; wholly bound to that state's jurisdiction.

Exclusive Economic Zone (EEZ): It is the water area extending up to 200 nm from a country's baseline. The coastal state has right over all natural resources; however, other states also have rights and liabilities, and international rules are valid.

High Seas: It is a term used for the water areas beyond internal waters, territorial waters, continental shelves and EEZ of all states. It is beyond the rules and laws of any states.

Continental Shelf: It refers to the extension of the land of a coastal state under the sea. The coastal state has all rights to make use of its water and underwater resources.

Baseline: It is the line along the coast of a country. It is used to define the borders of the state's jurisdiction and sovereignty on maritime zones.

Territorial Sea: It is the water area extending to 12 nm away from the baseline of a coastal state. It is bound to the laws of that state, but the vessels of other states have innocent passage right.

Contiguous Zone: It refers to the adjacent territorial water or international water up to 24 nm from the baseline of a coastal state. The coastal state has jurisdiction and sovereignty right.

3A MARITIME LAW AND CONVENTIONS

B Write the terms for passage and visit rights to complete their definition.

- Right of Transit Passage
- Traffic Separation Schemes (TSS)
- Right of Visit
- Non-Innocent Passage
- Innocent passage
- Right of Hot Pursuit

1 _____ doesn't involve harm to coastal state's security, regime, or peace.

2 _____ is the authorisation of a coastal state's warships to visit a foreign-flagged vessel when there is a suspicion for any violation of the state's laws.

3 _____ threatens the coastal state's security, regime, and peace.

4 _____ is the authorisation of a state's warships to pursue and capture a foreign-flagged vessel within its territorial or contiguous zone; or even in high seas if there is a strong suspicion for a violation of the coastal state's laws.

5 _____is the right for non-stop passage through the straits of a state for all other states' vessels.

6 _____is a system developed by IMO to regulate the marine traffic and reduce marine accidents.

C Read the paragraphs and write the correct terms as the title of them.

1 Archipelagic Waters

A _____

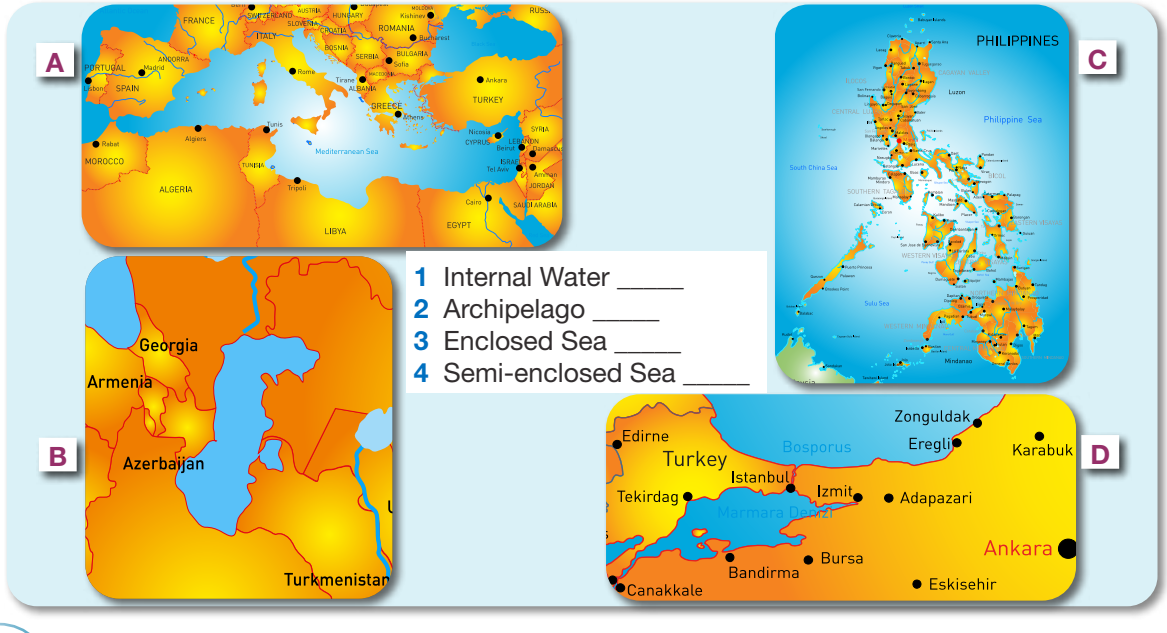
It is a basin, a gulf or a sea which is surrounded by two or more coastal states and connects to an ocean by only a narrow canal. The coastal states around it must cooperate with each other on rights and responsibilities for these waters.

2 Enclosed/Semi-Enclosed Sea

B _____

It is a water zone surrounded by a group of islands whose extreme points form a baseline for the state. The rights of this state are similar to coastal states' rights on their territorial waters.

D Match the names of water areas that you have learned with the charts below.



1 Internal Water _____
2 Archipelago _____
3 Enclosed Sea _____
4 Semi-enclosed Sea _____

2 INTERNATIONAL MARITIME CONVENTIONS

I. LEAD IN Discuss the answers to the following questions.

1 What do you think conventions are prepared and signed for?

2 What kind of issues can be regulated through conventions?

II. VOCABULARY Complete the conventions with the given words and write the number of the conventions next to their abbreviations in the boxes on the left.

Tonnage	Ballast	Luggage	Pollution	~~Collision~~	Unlawful

	BWM
	TONNAGE
	SUA
1	COLREG
	PAL
	CLC

1 Convention on the International Regulations for Preventing ***Collision*** at Sea

2 Athens Convention relating to the Carriage of Passengers and their_____ by Sea

3 Convention for the Suppression on _____ Acts Against the Safety of maritime Navigation

4 International Convention for the Control and Management of Ships' _____ Water and Sediments

5 International Convention on _____ Measurement of Ships

6 International Convention on Civil Liability for Oil_____ Damage

III. READING AND WRITING

A Re-order the words in parenthesis to complete the names of IMO conventions.

1 **(FAL)** Convention of Facilitation of International Marine _____ **(f/r/t/f/c/i/a)**

2 **(SOLAS)** International Convention for the _____ **(t/f/a/s/e/y)** of Life at Sea

3 **(STCW)** International Convention on Standards of _____ **(r/g/i/n/t/a/i/n)**, Certification and Watchkeeping for Seafarers

4 **(MARPOL)** International Convention for the Prevention of _____ **(o/l/t/u/l/p/i/n/o)** from Ships

5 **(MLC)** Maritime _____ **(b/r/u/o/a/l)** Convention

B Write the abbreviations for the conventions from Exercise A.

A _____ is adopted to prevent environmental pollution caused by ships.

B _____ sets the standards for safety of construction, equipment and operations of ships.

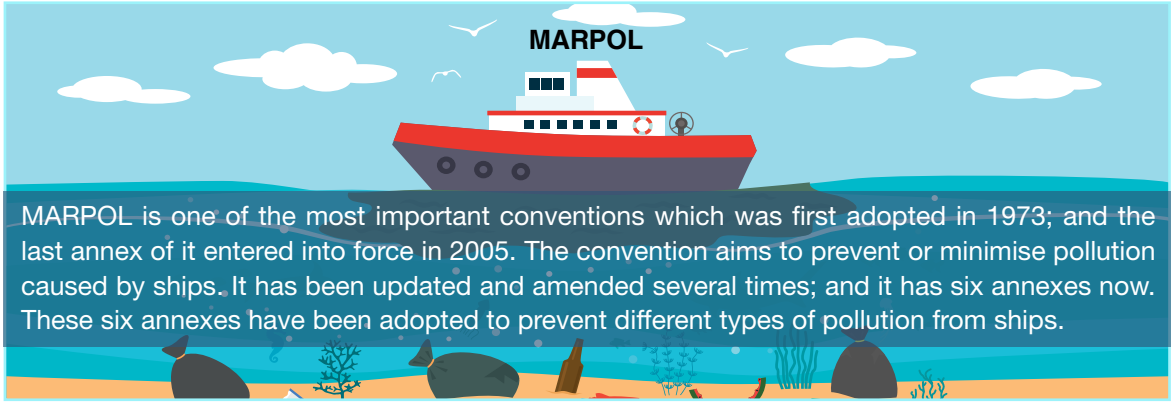
C _____ is adopted to set the standards for working conditions of the ship crew.

D _____ specifies the standards for certification, training and watchkeeping of seafarers.

E _____ aims to prevent unnecessary delays due to marine traffic.

3A MARITIME LAW AND CONVENTIONS

C Read the paragraphs about three basic IMO conventions and complete the sentences.



MARPOL

MARPOL is one of the most important conventions which was first adopted in 1973; and the last annex of it entered into force in 2005. The convention aims to prevent or minimise pollution caused by ships. It has been updated and amended several times; and it has six annexes now. These six annexes have been adopted to prevent different types of pollution from ships.

SOLAS

SOLAS is another essential convention which was first adopted in 1914 upon The Titanic disaster. The basic concern of the convention is safety of commercial ships; and the purpose is to set minimum standards for building, condition of the equipment and safe navigational operations. The last updated version entered into force in 1980. It consists of fourteen chapters specifying the obligations to comply with its requirements, and flag states have to ensure this compliance for the vessels under their flag.

STCW

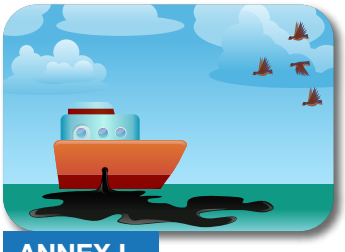
STCW is one of the key conventions which was first adopted in 1978. The last amended version was put into force in 1997. The aim is to specify minimum standards for training, certification and watchkeeping of seafarers since human factor is very important for safety on board. The convention consists of eight chapters prescribing standards for several matters including general provisions, training and certification of ratings and officers in all departments, emergency, occupational safety, medical care and watchkeeping.

1 _____ determines the standards of equipment of a vessel in terms of safety.
2 _____'s objective is to prevent pollution from ships.
3 _____ was adopted in response to Titanic disaster.
4 _____ is more concerned with human element in safety.
5 MARPOL has _____ annexes dealing with different types of pollution.
6 _____'s last updated version entered in the force later than the other two.
7 _____ deals with training of crew members.

D1 Complete the missing letters of the words in MARPOL Annexes.

_____Pollution by H_ _ _ f _l Substances Carried by Sea in Packaged Form
_____A _ _ Pollution
_____Pollution by N _ x _ _ _s L _ q_ _d Substances in Bulk
_____Pollution by G_ _ b _ g _
_____Pollution by O_ _
_____Pollution by S_ w_ _e

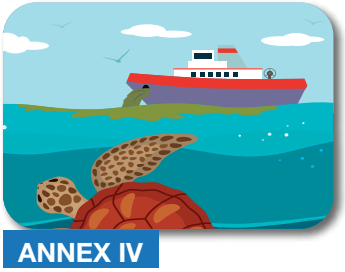
D2 Match the pollution types in Exercise D1 on Page 98 with the pictures below. Write the correct annex number next to the pollution types.


ANNEX I

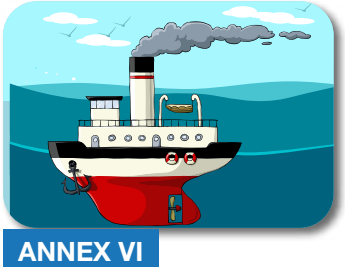

ANNEX II



ANNEX III


ANNEX IV


ANNEX V


ANNEX VI

E Re-order the words to write the names of conventions or rules.

1 on / Convention / Salvage / International

_____

2 Safe / Convention / for / International / Containers

_____

3 Rules / York Antwerp

_____

4 Registration / United / Convention / on / Ships / Conditions / for / Nations / of

_____

5 International / Ships/ of / Arrest / on / Convention

_____

IV. SPEAKING **Discuss the importance of the following conventions in groups. Explain your reasons.**

MARPOL	SOLAS	STCW	~~COLREG~~	SUA	FAL	MLC	CLC	BWM

e.g., *I think COLREG is one of the most important conventions, because COLREG aims to minimise collisions at sea. Collision is one of the most harmful marine accidents. It may cause injuries, loss of life, damage to the vessels and marine pollution.*

3 SURVEYS

I. LEAD IN

A ship survey is an inspection procedure involving the following: the control of the vessel's seaworthiness and its convenience for human living; the qualifications and certificates of all crew members including the master; whether the crew members are familiar with essential shipboard procedures or not, and whether the vessel is operated in compliance with international law or not.

Discuss the answers to the questions with your classmates.

1 Why do you think it is important to inspect ships?

2 How do you think the inspection officers do surveys?

II. READING AND VOCABULARY

A Read the text and complete it with the given words in the box.

deficiencies	substandard	requirements	departure	registry	inspections

PORT STATE CONTROL AND FLAG STATE CONTROL

Port State Control (PSC) is the inspection of foreign-flagged ships in national ports, and a kind of precaution against substandard shipping. PSC officers inspect ships to verify that the condition of the ship and its equipment comply with the _____ **(1)** of international regulations such as SOLAS, MARPOL, STCW, and MLC.

Flag State Controls (FSC) are the inspections which are carried out by the ship's _____ **(2)** state, if possible, before _____ **(3)** for international shipping. The aim is to ensure that the flag registered ships do not have any technical _____ **(4)** during PSC. The ships are classified as 'white', 'grey', and 'black', based on flag state controls among countries.

The primary responsibility of ensuring ships' technical standards belongs to the flag state, so port state controls are made to provide a backup to flag state controls. They are held according to a scheduled program to avoid time consumption from multiple _____ **(5)** at every port. Regional coordinated inspections within the member states aim to provide a safety net to detect _____ **(6)** ships more efficiently. PSC officers complete their inspections by stating the detected deficiencies' codes in the PSC report at the end of their controls.

B Write the words from the box on the right to make collocations.

1 detect _____

2 carry out _____

3 comply with _____

4 classify _____



III. WRITING AND SPEAKING

A1 Match the checks of PSC inspectors with the standards to be achieved.



PSC inspectors might…

1 inspect the accommodation and the galley
2 check log books in various departments of the ship
3 ask any crew member to tell how to use an equipment
4 check life-saving appliances
5 check communication equipment
6 talk to crew members and check their resting hours
7 check the tanks
8 check the machinery



to make sure that…

8 **a** they are maintained and operational.
____ **b** they are up-to-date and kept properly.
____ **c** there is no leakage from any of them.
____ **d** they are not fatigued.
____ **e** all of them are in good condition and ready to be used in case of an emergency.
____ **f** the crew members live in a healthy environment and eat healthy food.
____ **g** s/he is trained properly to use it and know the procedures well.
____ **h** safety warnings can be received, and distress messages can be sent without problem.

A2 Work in groups. Discuss what other things PSC inspectors might check on a vessel and write four of them in full sentences as in the example below.

e.g., *PSC inspectors might check the machinery to make sure that they are operational.*

_____
_____
_____
_____

ABBREVIATIONS Write the abbreviated terms in full.

1 **UNCLOS** _____
2 **EEZ** _____
3 **NM** _____
4 **TSS** _____
5 **PSC** _____
6 **FSC** _____

PROJECT Work in groups and search the water areas around Türkiye. Prepare a presentation indicating the water zones that you have learned around Türkiye on a chart. Give information about economic rights and jurisdiction of Türkiye on these water areas.

3B MARITIME MANAGEMENT

INTRODUCTION

I. LEAD IN

Discuss the answers to the questions with your classmates. Share your views.

1 What do you understand from ship management?

2 What factors do you think are included in effective ship management and why?

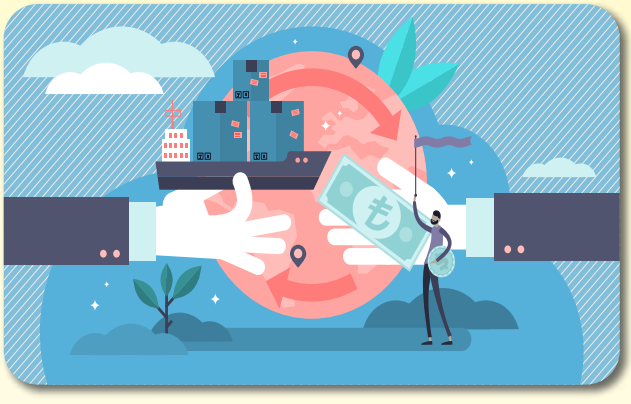
II. READING AND VOCABULARY

A Read the text and answer the questions.

COMMERCIAL AND TECHNICAL MANAGEMENT

Ship management is the process of dealing with **economic,** commercial and **institutional** issues within shipping business. The aim is to provide safe and efficient ship operations in order to meet interests of owners, hirers, and charterers. The efficient operational, commercial, and **strategic** ship management is related to external and internal developments in shipping industry.

In order to carry out commercial transactions of a ship, it needs to be technically in good condition. It is very important to **administrate** and pursue the necessities and references of the classification societies, the ship's flag state and the countries that the ship calls at ports. Shipping companies carry out technical management of the ships they own by providing the qualified crew, technical managers, technical consumables, replacement parts, dry dock repairs and maintenance. Updating and **executing** the ship's safety management system in accordance with the International Safety Management (ISM) and International Ship and Port Facility Security (ISPS) Codes are also the shipping company's responsibility.



The commercial **transactions** in maritime include services and **procedures** such as the contracts that establish the terms of cargo carriage, INCOTERMS that are used to make these contracts clear and understandable, and the services of agencies and ship brokering services.

1 What is the aim of ship management?

2 Who do ship owners have to answer to about the condition of their ship?

3 How do shipping companies execute technical management?

4 What are international codes for safety management?

5 What are INCOTERMS used for?

B Read the text in Exercise A on Page 102 again and match the definitions with the highlighted words.

1 _____: related to a large organisation
2 _____: to direct or manage a business or an institution
3 _____: an exchange or transfer of money, goods or services
4 _____: related to money, trade and industry
5 _____: related to following the best ways to achieve specific goals
6 _____: a set of actions taken for an official way of doing something
7 _____: carrying out or fulfilling an assigned task

C Use the correct form of the words from Exercise B to complete the sentences below.

1 The _____ situation of the country is going better in the first half of the year.
2 We must follow the safety _____ to avoid accidents and casualties at work site.
3 They need more crew members to _____ the operations of such a big ship.
4 In order to attract more clients the company needs some _____ reforms.
5 The officers must be liable to_____ the shipboard work.
6 The details of all the _____ must be shared with shareholders in order not to cause any speculation.
7 The _____ planning was so poor that, they could not finish the work on time and the company lost a large amount of money.

III. WRITING

A Find the other halves of the phrases related to technical management from the text on Page 102 and complete them.

1 _____*qualified*_____ crew
2 dry _____ repairs
3 safety _____ system
4 _____ societies
5 _____ parts
6 flag _____ country

B Use the collocations from Exercise A to complete the sentences.

1 The _____ cost more than the machine, itself, so we decided to buy a second-hand.
2 The _____ has the right and responsibility to make the ship comply with the international laws and conventions.
3 The cranes lift massive steel sections at docks to get ready for _____.
4 Check and update the _____ regularly for safe managing and operating of the ships.
5 _____ are non-governmental organisations setting standards for ships and inspecting them.
6 A shipping company is looking for _____ for their new voyage lines.

1 SHIP BROKING AND SHIP CHARTERING

I. LEAD IN

Discuss the answers to the questions with your classmates. Read the text and check your answers.

1 Do you know the difference between ship chartering and ship broking?

2 Do you know any shipping agencies? What do you know about their work?

II. READING AND VOCABULARY

A Match the terms with their definitions.

~~Ship broker~~	Ship chartering	Shipping agency
Sub-charterer	Ship charterer	Ship broking

A _____ **(1)** is a corporate person or a company which operates the cargo handling between the ship and the port in the name of ship owners and ship hirers for a **specified** charge. It is also responsible for the protection of the benefits of the counterparties.

_____ **(2)** is a commercial service in which the ship broker gets a specified **commission** price for conveying negotiations between the **counterparties** (buyers, sellers, ship owners, charterers etc.).

A ***ship broker*** **(3)** is the person or a company who acts as an **intermediary** between the sellers and buyers of ships. They also arrange the transportation of the goods by processing negotiations between ship owners and charterers, or sellers of goods.

_____ **(4)** is a maritime industrial **transaction** in which the ship owners hire their ships to a charterer for cargo transportation.

A _____ **(5)** is the person or the company who hires a ship from its owner.

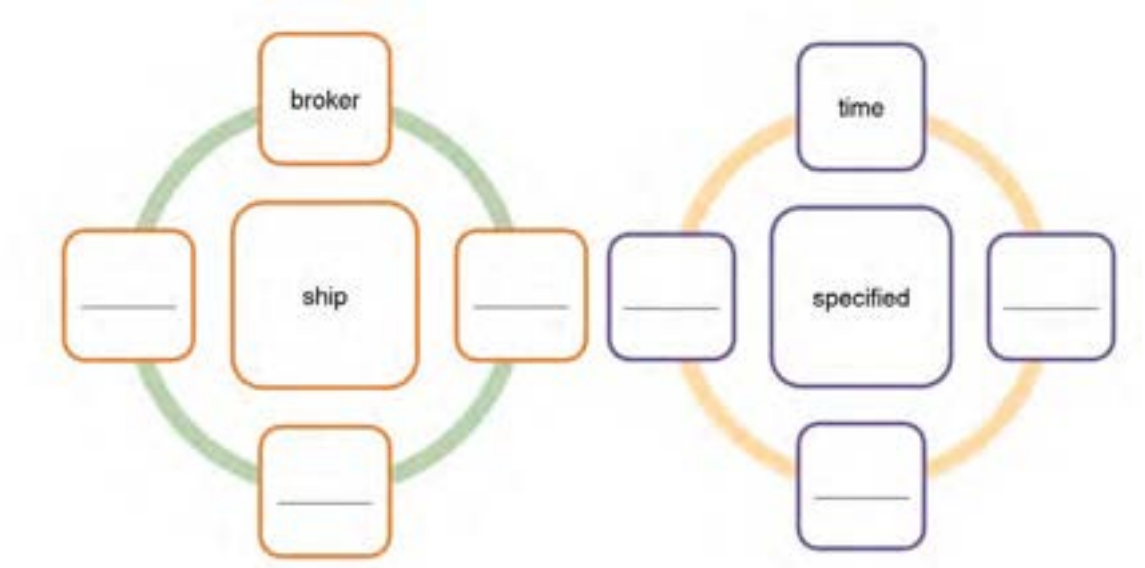
The hirer sometimes hires the ship to another party since it is more **profitable**. In this case, the person who hires the ship from the previous hirer is called _____ **(6)**.

B Match the highlighted words in the text with their definitions.

WORDS	DEFINITIONS
1 Counterparty_____	A making it in a way that brings profit
2 Commission_____	B defined or explained clearly and exactly
3 Intermediary_____	C the activity of buying or selling something
4 Transaction_____	D the buyer or the seller in a financial contract
5 Profitable_____	E a specified fee paid to an intermediary person/ agent for a job
6 Specified_____	F a person/a company who acts as a link between counterparties

C Use the given words to complete the collocation charts below.

commission	hirer	charge	charterer	~~time~~	owner	port	~~broker~~



III. LEARN THIS

We make nouns by adding **–er/-or** to the end of the verbs and use them as agents, the doer of the action in the sentence.

e.g., ***hire (verb)+er → hirer (noun)*** ***convey (verb)+or →conveyor (noun)***

*He **owns** a big company exporting goods from all over Asia. **(verb → action)***

*The **owner** of the company decided to take an action against the contract. **(noun → agent)***

Make nouns from the verbs given in brackets to complete the sentences.

1 The _____ of the house wanted extra money for the furniture in the living room. **(sell)**

2 Every _____ should read the others' works to extend their vision. **(write)**

3 All _____ must obey the traffic rules for their and others' safety. **(drive)**

4 A certified and skilled _____ can offer more effective and safer workout programme to meet his/her clients' needs. **(instruct)**

5 An _____ must check all the equipment before starting the work. **(operate)**

2 CHARTER PARTIES

I. LEAD IN

A charter party is a written contract between the ship owner and the hirer. There are three main types of hiring: bare boat charter party, voyage charter party and time charter party.

Discuss the answers to the questions with your classmates.

1 What do you know about different types of charter parties?
2 What important considerations does ship chartering require?

II. READING AND VOCABULARY

A Match the types of charter parties with their definitions.

TYPES OF CHARTER PARTIES

Time Charter Party	Voyage Charter Party	Bare Boat Charter Party
1 _____	2 _____	3 _____
is a kind of contract in which the ship is hired without carriage warranty and its crew. The technical and the commercial use of the ship are transferred to the hirer (freighter), and also all the expenses and charges belong to the freighter from the moment the contract is signed. The freighter has a right to change the existing flag of the ship.	is a kind of contract in which the usage of the ship and its crew is hired by the owner to the hirer for a specified time. The freight is claimed according to the deadweight ton, or the time stated in the contract. In this kind of contract the technical management of the ship belongs to the owner and the commercial usage is assigned to the hirer.	is a kind of contract just valid for one voyage which ensures the cargo being carried between two specific ports or more. The freight is calculated per ton regardless of the voyage time. Both the technical and commercial management of the ship belongs to the owner of the ship and none of them is assigned to the hirer.

B Here are some terms used to define the charter parties. Match them with the phrases with the same meaning.

TERMS	PHRASES
1 warranty ____	a Demise Charter Party
2 the expenses ____	b when the contract is signed
3 Voyage Charter Party ____	c defined exactly; stated
4 Bare Boat Charter Party ____	d when the contract ends
5 On hire ____	e the cargo capacity of the ship
6 Off hire ____	f the costs
7 Deadweight ton ____	g Trip Charter Party
8 specified ____	h guarantee

C Write the correct item in the boxes to complete the definitions of the terms.

A Corporate Person	B Freight Forwarder	C Contract of Affreightment

_____ **(1)** is not a person, indeed. It is a kind of association or corporation which deals with trading or business activities, but it is regarded and represented as a person on official documents like contracts.

_____ **(2)** is a kind of agreement between the ship owner and a charterer to carry the specified cargo of the charterer in his ship or ships for a specified time.

_____ **(3)** is a corporate person or a company which conveys the cargo from manufacturers to the buyers safely and efficiently via various means of transportation (sea, air, or land). The company or corporate person acts as an intermediary between the seller and the buyer and hires the ships or other means to transport the cargo for a voyage like a voyage charterer.

III. SPEAKING AND WRITING

Discuss the answers to these questions in groups and write notes revising what you've learned. See the example.

e.g., *What is a charter party? Why is it important for owners and hirers?*

-A charter party is a contract between the charterer and the ship owner. It is important because it is the evidence of the negotiation between the two, and it prevents possible disputes.

1 What are the types of charter parties? What are the differences?
2 Who/What is a freight forwarder?
3 Who/What is a corporate person? Is it a real person?

3 INCOTERMS

I. LEAD IN

Discuss the answers to the questions. Read the text and check your answers.

1 Do you know what INCOTERMS stand for? What are they used for?

2 What do you know about the responsibilities and rights of buyers and sellers of ships?

II. READING AND VOCABULARY

A Read the text and answer the questions.

International Commercial Terms (INCOTERMS)

INCOTERMS are set of codified rules for pre-defined commercial terms. They were put into practice to standardise the terms used in international commerce by **International Chamber of Commerce**. They consist of three-letter abbreviations which represent the different modes used in international transportation. INCOTERMS are used to define the buyers' and the sellers' respective rights and responsibilities about when and how the delivery of the cargo would take place; as well as the freight, insurance and customs expenses would pass from one to the other to handle the chartering safely during transportation. **Transporters** are contractual agreed persons whose business is to carry the goods in a combination of by road, water, or air ways. Bill of lading, transportation receipt or transporter's voucher is given to the seller to prove the goods are received by the transporter.

1 What are INTERCOMS?

2 Who were they put into practice by?

3 What are INTERCOMS used for?

4 Who are transporters?

5 What is the function of the documents given to the seller?

B Here are some key words to understand the INCOTERMS. Write them next to their definitions.

cost delivery insurance pay carrier free duty alongside

1 _____: to give money to someone for something you buy or a service you get

2 _____: a tax paid to the government for the goods you import

3 _____: beside or together with something or someone

4 _____: not needing to be paid for; having no cost

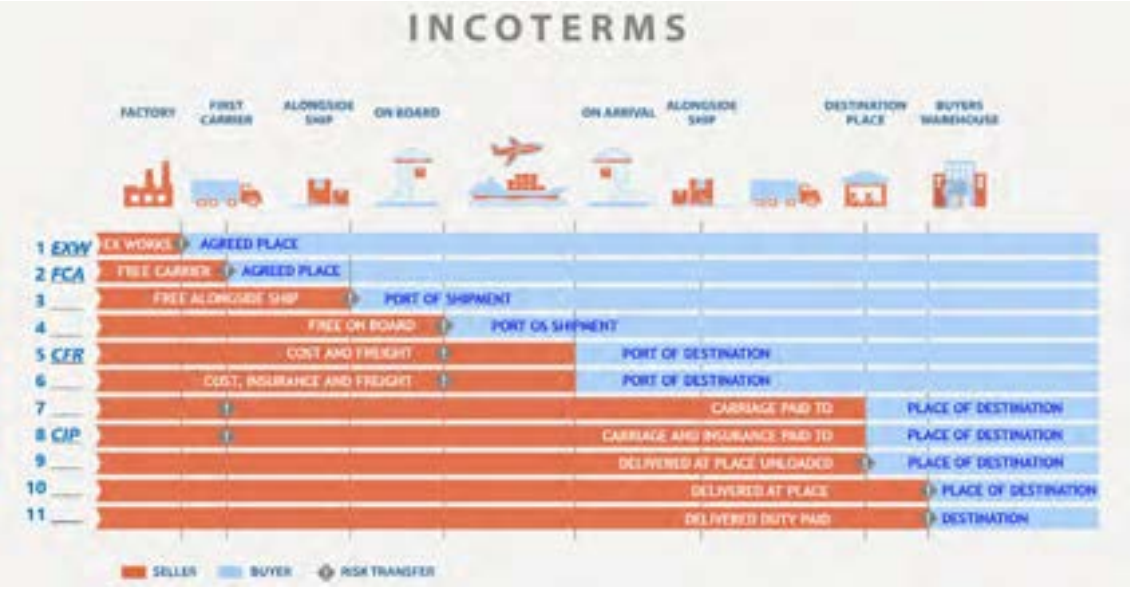
5 _____: the amount of money needed for a business

6 _____: a thing or a person that carries something

7 _____: the act of taking goods, parcels, letters etc. to their designated destination

8 _____: an agreement in which a company pays for your costs in case of an accident or an injury

C Look at the chart about INCOTERMS and write the correct abbreviations on the left.



III. SPEAKING AND WRITING

A Study the chart about INCOTERMS above. Work with your partner, ask and answer questions as in the example.

e.g., *What does EXW tell about the responsibilities of the buyer and seller?*

EXW tells that the buyer takes the risk and responsibility about the cost and insurance at the time the cargo is loaded from the factory until it is delivered to its destination and unloaded at the buyer's warehouse.

B Explain one of the INCOTERMS with your own words.

_____

_____

_____

ABBREVIATIONS

Write the long forms of abbreviations you have learnt in this part.

1 **ISM:** International _____ _____

2 **ISPS:** International _____ and _____ _____ _____

3 **INCOTERMS:** International _____ _____

PROJECT Make a research about INCOTERMS and prepare a brochure showing the responsibilities between buyers and sellers regarding the costs, risks and responsibilities for cargo insurance and regulatory compliance. Use pictures and diagrams and explain the rules briefly.

3C MARITIME DOCUMENTS AND SHIP CERTIFICATIONS

INTRODUCTION

I. LEAD IN **Discuss the answers to the questions with your classmates.**

1 What kind of documents do you think a ship has to keep during sailing? Who is responsible for these documents?

2 Do you know where and how the maritime records are kept?



II. READING AND VOCABULARY

Read the paragraph and write the highlighted words next to their definitions.

All the operations and transactions on the ships are recorded. All these records are **legal**, and they have **evidential** value. Ship certificates are **official** documents which include evidence for the ship's being commercially operational and whether it is operated safely or not. They are **submitted** to the authorities when asked for general **inspection** or in order to clarify the facts about unexpected **incidents** or accidents during operations.

WORDS	MEANINGS
1_____:	providing or relating to proof of something to be true or not to be true
2_____:	an extraordinary or unpleasant event
3_____:	agreed to or arranged by the authorities; authorized
4_____:	connected with or allowed by the law; lawful
5_____:	to present a document or a report to the consideration of an authority
6_____:	an official visit by experts or authorized people to check that everything is correct and legal

1 MARITIME RECORDS

I. LEAD IN

There are many journals on a ship in which the records are kept. The general ship recording journals are deck log book on the bridge and engine log book in the machinery room.

Discuss the answers to the following questions. Share what you know about them.

1 Have you ever seen a log book used on a ship? What is it like?

2 What do you think is written on the deck and engine log book?

II. READING AND VOCABULARY

Deck Log Book

Deck log book is an official **document** recording all the relevant information about events related to the governing of the ship -as well as essential or extraordinary incidents- that occur during sailing or while on port. It is submitted to official **authorities** for **justification** in case of any **disputes**. There are records of sailing and other variable parameters in the deck log book as well as departure, arrival, weekly, monthly, drills and other irregular **records**. It is kept on bridge all the time.

A Read the paragraph and match the highlighted words with their definitions.

1 _____: written or stored information or description of an event for the future use

2 _____: an official written or printed paper giving specific information

3 _____: an official argument or disagreement

4 _____: explanation of something that is acceptable or reasonable

5 _____: a group of people with legal power and responsibility to make decisions or apply sanctions about a particular area

B Use the words from Exercise A to complete the sentences.

1 There is no _____ for talking to people in bad manners.

2 The _____ have decided to change the procedures about the applications.

3 If there are any _____ between the two parties, they should ask for their lawyers' advice.

4 All these _____ need to be copied and put into the file for the investigation.

5 You must be very careful when you fill in the _____ on these log books.

3C MARITIME DOCUMENTS AND SHIP CERTIFICATIONS

C **Complete the phrases about the records in a deck log book by using the words in the box. Check the words from a dictionary if necessary.**

controlling	**passage**	**discharging**	**boarding**	**lighthouse**
~~**changing**~~	**rope**	**commence**	**watch**	**lubricating**

Records During Sailing, Anchoring and Port Watches	
1 ***Changing*** of watch	Passing by buoy, foreland and **6** _____
Checking ropes at port **2** _____	Anchor watch, **7** _____ anchor
Reporting fuel oil, **3** _____ oil, water barge boarding and unboarding information	Reporting the pilot's **8** _____ and personal information of the pilot
Details of **4** _____ manoeuvring	EOSP (End of Sea **9** _____) time information
Records of main incidents during loading and **5** _____	COSP (**10** _____ of Sea Passage) time information

III. WRITING

A **Study the table about deck log book recordings in certain intervals and write sentences as in the example.**

RECORDS BEFORE DEPARTURE	RECORDS BEFORE ARRIVAL
1 Checking/searching for stowaways **2** Navigation instruments and system test **3** Steering gear test **4** Engine test	**1** Navigation instruments and system test **2** Steering gear test **3** Engine test
WEEKLY RECORDS	**MONTHLY RECORDS**
1 Ship hygiene check **2** Life-saving equipment check	**1** Life-saving equipment check **2** Ship safety meetings

e.g., *Stowaway checks are entered in the deck log book before each departure.*

Life-saving equipment checks are recorded in the deck log book both weekly and monthly.

B Complete the chart about ship records books by writing the information under the correct categories to find out what these books are used for. The deck log book is given as an example.

RECORDINGS:

All parameters about solid waste

All records of communication and operations

All parameters about fuel oils

All essential and extraordinary incidents about governing of the ship→1

Main engine and auxiliary engine parameters

REASONS:

To prevent the seas from being polluted with fuel oil from the ships

To comply with the regulations stated in international agreements about communication

To prevent the seas from being polluted with solid waste

Submitted to the authorities for justification in case of any disputes →2

It is evidential and juridical in case of accidents or unexpected incidents that arise from manoeuvring.

THE RECORD BOOK	WHAT IS RECORDED	WHY IT IS RECORDED
DECK LOG BOOK	1 ***All the essential and extraordinary incidents about governing of the ship***	2 ***Submitted to the authorities for justification in case of any disputes***
ENGINE LOG BOOK	3 _____	4 _____
OIL RECORD BOOK	5 _____	6 _____
GARBAGE RECORD BOOK	7 _____	8 _____
RADIO/GMDSS LOG BOOK	9 _____	10 _____

IV. SPEAKING

Study the chart above. Ask and answer about the maritime records with your partner as in the example.

e.g., ***A*** *What is recorded in a deck log book?*

B *All the events occur during sailing related to the management of the ship.*

A *Why is it important?*

B *Because it is an evidence of all the events on board for the authorities.*

2 SHIP CERTIFICATION

I. LEAD IN

The documents and certificates required to be carried on ships certify that the ship is appropriate to the classification, construction, machinery and the equipment regulations. There are many certificates required to be kept on board and need to be submitted to the authorities when asked for.

Discuss the answer to the question with your classmates.

What kind of certifications do you think a ship needs to get and why?

II. READING

A Read the information about some certificates that must be kept on board during sailing. Complete their names with the words given in the box.

Sanitation	Manning	Labour	Medical Fitness	Tonnage	Classification	Registry

CERTIFICATES ON BOARD

1 Certificate of _____ is a document which confirms the class of the ship.

2 Certificate of _____ verifies the flag state of the vessel that it is registered to.

3 Minimum Safe _____ Certificate mentions the minimum number of the crew need to be on board to run the ship.

4 International _____ Certificate is issued to state the measurements of GT and NT of the ship.

5 Maritime _____ Certificate proves that working rights of the crew on board are protected.

6 Ship _____ Control Exemption Certificate shows the ship is free of infection and contamination sources and is suitable for public health.

7 _____ Certificate confirms that seafarers are medically fit to work on sea-going ships, and they do not have a medical condition which could be a danger to other crew and/or passengers.

B Read the information in Exercise A again and say if these statements are TRUE or FALSE.

1 There is a certificate from which we can learn the type of the ship. _____

2 A person with a serious disease can get a certificate to work on ships. _____

3 There can be more crew working on board than it is stated in the certificate. _____

4 We can calculate the amount of the cargo the ship can carry by its certificate. _____

III. VOCABULARY

Here are some key words that you can see on ship certifications that will help you to know what they are about. Match them with their definitions.

certificate	**registry**	**manning**	**construction**	**security**	**sewage**	**load line**
pollution prevention	**anti-fouling system**	~~**synopsis**~~	**compliance**	**authorisation**		

1 _____: a coating, paint or surface treatment used to prevent unwanted organisms attaching to the hull of the ship

2 _____: waste matter and liquid from toilets

3 *synopsis*: a short description of the contents of something

4 _____: an official document that shows something is permitted to be done or someone is certified for doing something

5 _____: the act of stopping damage to the land, water and air caused by hazardous substances or waste

6 _____: the process that a ship is officially recorded and given a nationality

7 _____: the fact of acting according to an agreement

8 _____: the process of providing people to do a certain job

9 _____: an official document which confirms that required qualifications have been provided

10 _____: the work of building or making something

11 _____: freedom from dangers, damages, or risks; safety

12 _____: a marking on the side of a ship that shows the level below which the ship must not submerge when it is loaded

IV. WRITING AND SPEAKING

Complete the phrases by writing the missing words. Then try to guess what these certificates indicate and why they are needed. Share your ideas with your classmates.

Officers
Noxious
Efficiency
Machinery
Prevention

1 International Pollution _____Certificate for the Carriage of _____ Liquid Substances in Bulk

2 International Energy _____Certificate

3 Certificates for Masters, _____and Ratings

4 Hull and _____Certificate

3 CARGO AND PORT DOCUMENTS

I. LEAD IN

There are some documents related to the ship and the cargo it carries. They are required at ports so they are always kept on board. Cargo documents indicate the issues related to the load distribution, readiness for loading or discharging of the cargo. The most important of them are Notice of Readiness and Bill of Lading. Port documents are standard forms of documents complying with FAL convention, demanded by the port authorities after the arrival and before the departure. FAL is a convention whose purpose is to facilitate international shipping traffic by providing mandatory standardized rules and regulations.

Discuss the answers of these questions with your classmates.

1 What do you think is recorded in cargo and port documents?

2 Why do you think it is important to keep cargo documents on board?

II. READING

A Match the information recorded in the port documents and their names.

DOCUMENT	RECORDED INFORMATION
1 General Declaration____	a all valuable personal belongings of the crew members
2 Crew List____	b passengers on board existing for any kind of reason
3 Crew's Effects Declaration____	c non-existence of animals, weapons, ammunition, and stowaways on board
4 Crew's Currency Declaration____	d medicines found in the ship hospital
5 Ship's Stores Declaration____	e verification of seaworthiness of the ship for departure
6 Passenger List____	f general information about the ship and cargo
7 Nil List_____	g the names and personal information of the crew
8 Medicine List____	h provisions, the equipment and replacement parts on deck and in the engine room
9 Port Clearance_____	i the amount of foreign currency that the crew members have

B Read two paragraphs and complete them with the given terms.

demurrage	bill of lading	dispatch	dirty	laytime

Necessary information about the cargo such as quantity, weight and measurement is recorded in_____ **(1)**. There are two types of this document as clean (when the cargo is not damaged) and _____ **(2)** (when the cargo is damaged or spoiled). It is usually negotiable, and it has three main functions:

- Evidence the contract of carriage
- Receipt of the goods shipped
- Document of title

_____ **(3)** is the amount of the time allowed in hours or days in a voyage charter for the loading or the unloading of cargo. _____ **(4)** is paid if laytime is exceeded. _____ **(5)** may be paid to the charterer by the ship owner with the terms of the charter party if the whole period of the laytime is not needed.

C Match the cargo documents with their definitions using the clues written in bold.

~~The Fixture Note~~	~~Cargo Manifest~~	Letter of Protest	Ship's Pocket Plan
Bill of Lading	The Cargo Plan	The Booking Note	
Mate's Receipt	Time Sheet	Statement of Facts	

1 ***Cargo Manifest*** is a **united list** of all the cargo on board.

2 _____ is a certificate of receipt edited and signed by **the Chief Mate** when the cargo is loaded.

3 _____ notifies the essential storage area is **booked** for the specified cargo to be loaded.

4 _____ shows the loading and discharging **duration** and a reference for calculating the **'laytime'**, **'dispatch'** and '**demurrage**'.

5 ***The Fixture Note*** is **an engagement letter** signed between the two parties before the charter party, providing a basis for the agreed charter party.

6 _____ is used to stow the cargo according to **the dimensions of storage areas** and to find out the maximum loading capacity of the ship storage areas by the brokers.

7 _____ shows **the plan** for the storage area and amount of the cargo. It must be prepared according to sea-worthiness and stability of the ship.

8 _____ is the most important valuable and legal document on board which includes the necessary information about **the cargo**.

9 _____ states that the master of the ship makes **an objection** to an adverse condition/incident about the ship, the cargo or the weather.

10 _____ has recordings about the exact date and time of **all the incidents** during cargo operations. It is prepared by the ship agency and the demurrage is calculated in accordance with this document.

III. SPEAKING

Study the information about cargo and port documents in Exercise A, B (on Page 116) and C. Ask and answer questions about them as in the example.

e.g., *What is recorded on a passenger list?*

- The names and personal information of the passengers on the ship is recorded on a passenger list.

What does cargo plan include?

- It includes the plan of cargo storage areas.

IV. WRITING

Notice of Readiness is a kind of cargo document signed by the master himself, and vouched to the concerning parties of the cargo to indicate that the cargo is ready for loading or discharging at berth. The document is sent by fax, telex, or e-mail via radio when the ship is still at berth.

Fill in Notice of Readiness using the information given below.

UZUN YASAR	**23 JAN 2019**	**CORN**
05.30LT / 08.30 UTC	**82,400**	**M/V CUMHURİYET**

NOTICE OF READINESS

Messrs

This is to notify that _____ **(1)** under my command has arrived in Santarem Port on_____ **(2)** at _____ **(3)** hours and is ready to discharge cargo of _____ **(4)** metric tons of _____ **(5)** as per clauses and conditions of covering charter party.

Yours Truly

_____ **(6)**
MASTER

TENDERED: 23 JAN 2019 **HRS:** 08.20

ACCEPTED: 23 JAN 2019 **HRS:** 08.40

ABBREVIATIONS

Write the long forms of abbreviations. Use the given words.

1 Safety _____ Certificate (SMC)
2 International Ship _____ Certificate (ISSC)
3 International _____ Prevention (IOPP) Certificate
4 Continuous _____ Record (CSR)
5 Motor _____ (MV or M/V)

Oil Pollution
Synopsis
Vessel
Management
Security

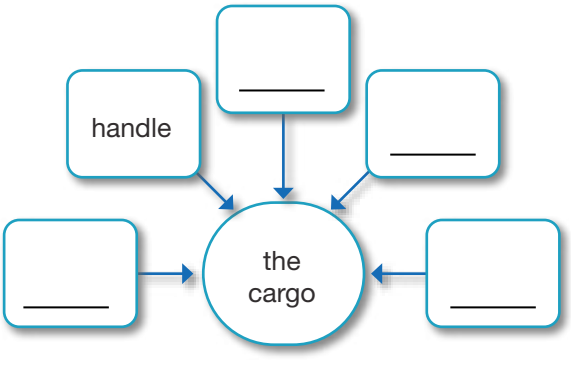
PROJECT Make a research about ship certifications related to pollution at seas. Prepare a presentation about them.

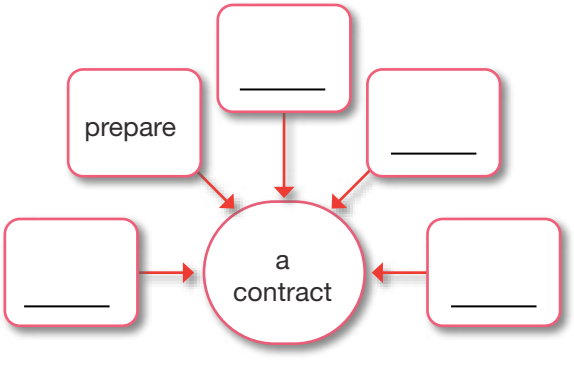
SELF ASSESSMENT 3	1	2	3
1 I can talk about the basic conventions for maritime transportations.	☺	😐	☹
2 I can understand and use the basic terms for maritime law.	☺	😐	☹
3 I can talk about maritime zones and passage rights.	☺	😐	☹
4 I can tell the basic terms for ship surveys and their functions.	☺	😐	☹
5 I can understand and use the terms for ship chartering and ship broking.	☺	😐	☹
6 I can talk about the types of charter parties and their working principles.	☺	😐	☹
7 I can tell the basic INCOTERMS and their meanings.	☺	😐	☹
8 I can talk about the basic records on ships.	☺	😐	☹
9 I can tell the basic ship certificates and their functions.	☺	😐	☹
10 I can tell the basic cargo and port documents and their features.	☺	😐	☹

REVISION 3

A Use the given words to complete the collocation charts below.

load	~~prepare~~	deliver	end	~~handle~~
start	discharge	make	carry	sign





B Choose the correct option.

1 _____is an organisation which is accepted as the authority in adopting conventions and putting them into force.

A SOLAS **B** MARPOL **C** IMO **D** FAL

2 _____can extend up to 200 nm from the baseline of a coastal state.

A Territorial sea **B** EEZ **C** Contagious zone **D** Internal waters

3 STCW is mainly related to _____.

A training and certification of the crew
B marine traffic facilitation
C preventing marine pollution
D sovereignty rights of coastal states

4 The passage right of all states from the straits is called _____ passage right.

A innocent **B** non-innocent **C** visit **D** transit

5 _____ provides and pursues the management of all the routine operations about cargo between the ship and the port in the name of ship owners and hirers.

A Ship Charterer **B** Shipping agency **C** Ship broker **D** Freight

6 Voyage Charter Party is valid for a specified _____.

A route **B** time **C** date **D** commission

7 INCOTERMS is the abbreviation for International _____ Terms.

A Chartering **B** Communication **C** Company **D** Commercial

8 The _____ indicates the mutual agreement about the responsibilities of the owner and the charterer.

A charter party **B** bill of lading **C** affreightment **D** ship broking

9 **Laytime, demurrage** and **dispatch** are calculated according to_____.

A booking note **B** the fixture note **C** dock's receipt **D** time sheet

10 PSC and FSC are held in accordance with international _____.

A contracts **B** laws **C** regulations **D** companies



4

MARINE ENGINEERING

In this unit, you will...

- learn basic terms related to marine engines
- get familiar with the terms related to stationary and moving parts of the main engine
- talk about basic principles of engine operations
- recognise the types of engines used in maritime sector
- learn auxiliary systems and talk about their functions
- get familiar with engine log book entries and other recordings related to the engine room

4 MARINE ENGINEERING
4A MAIN ENGINES

INTRODUCTION

I. LEAD IN

Main engines provide necessary propulsion power for the vessel to move on water. Today, reciprocating internal combustion engines are used on the majority of vessels. The combustion happens in the cylinder in internal combustion engines. These types of engines convert chemical energy into thermal energy, and then thermal energy into mechanical energy. Diesel engines are preferred for the majority of ships since they are more powerful and efficient with low emission.

Discuss what you know about the main engine of a ship in the light of the following questions.

1 What can you see in the engine room of a vessel?
2 Do you know where the main engine of a vessel is?
3 Do you know any auxiliary systems in the engine room?

II. VOCABULARY

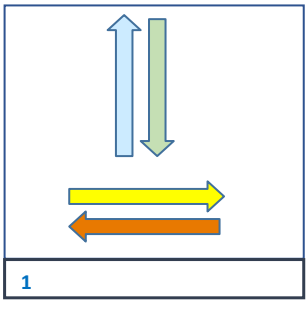
A The main engine consists of several stationary and moving parts. The words below are going to help you to have a better understanding of those parts. Complete the sentences using the words in the box with your partner. Use a dictionary if you need.

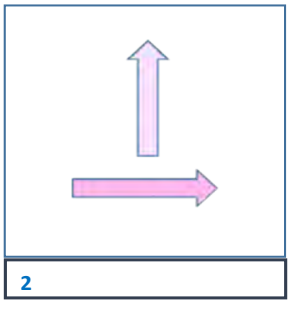
cylinder	piston	rod	tappet	gasket

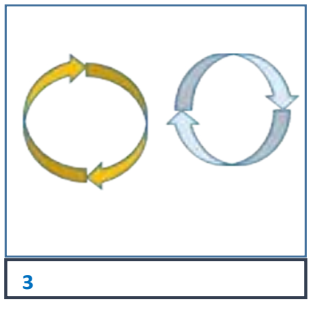
1 A ___*rod*___ is a straight metal bar that is used to connect two parts of something like an equipment or a machine.
2 A _____ is one of the moving parts of the main engine which travels in the cylinder and produces mechanical energy from thermal energy.
3 A _____ is a piece of soft material, like rubber, which is used to seal a junction to prevent leakage of any liquid or gas.
4 A _____ is a kind of lever which is moved by another part of the engine/machine and has a function in the transmission of the motion.
5 A _____ is the space in which the piston of an engine travels.

B Write the correct word under the pictures to describe the types of motions.

linear	circular	reciprocating


1


2


3

C Match the definitions with the terms related to engine processes.

A _____ is a sequence of processes that reoccur in an engine's cylinder, which comprises the basis for the operation of the engine.

B _____ is a phase of an engine cycle in which the piston completes one full travel along the cylinder.

C _____ is the process during which fresh air in the cylinder pushes the exhaust gases out.

D _____ , also known as burning, is a chemical process in which a substance (e.g., fuel) ignites as a reaction to its touch with oxygen.

1 Scavenge
2 Combustion
3 Stroke
4 Cycle

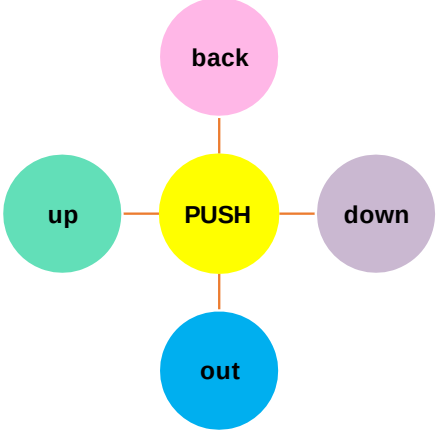
D1 Match the two halves of the collocations to form meaningful terms for diesel engines.

1 Mechanical	_____a chamber
2 Exhaust	_____b energy
3 Combustion	_____c ports
4 Scavenge	_____d power
5 Propulsion	_____e gases

D2 Complete the sentences using the phrases in Exercise D1.

1 Thermal energy is transmitted into _____ in the engine cylinder to produce the _____ for the vessel to travel on water.
2 _____ are pushed out from the cylinder by means of exhaust valves.
3 _____ are used instead of intake valves in two-stroke engines.
4 _____ is a separate room at the top of the cylinder where the combustion takes place.

E Write the correct preposition to complete the sentences.



1 They are pushing huge rocks _____ the hill and laying them up for building a set by the river.
2 He was such a rude and impudent person that he pushed the old woman _____ and bought his ticket without any sign of shame.
3 The cat stretched its legs and pushed itself _____ on the tree in a second.
4 The residents are trying to push the water _____ of their houses using buckets after the flood.

4A MAIN ENGINES

F Match the words with their synonyms or definitions with your partner.

1	convert	____a	to activate, cause to start
2	wear	____b	substance causing contamination, pollutant
3	layout	____c	leak tight
4	trigger	____d	the process of taking in
5	intake	____e	to catch fire, to inflame
6	leakproof	____f	to transform
7	ignite	____g	damage or erosion on a surface
8	contaminant	____h	placement

III. LEARN THIS

We make nouns from verbs or adjectives; and we make adjectives from verbs by adding some certain suffixes at the end of them such as **-al, -ure, -ion** and **-ing.**

A Write the words in the correct place to form meaningful nouns and adjectives. Make changes (if necessary) to convert the verbs into nouns/adjectives with your partner.

temperate	~~reciprocate~~	~~emit~~	~~intern~~	~~press~~	move	extern	combust

1	*internal*	-al	3	*pressure*	-ure
2			4		
5	*emission*	-ion	7	*reciprocating*	-ing
6			8		

B Choose the correct word from Exercise A to complete the sentences below.

1 Shell plating protects the vessel from _____ effects.

2 _____ _____ engines are usually used to propel sea-going vessels.

3 An engine must be environmentally friendly with low_____ of exhaust gases.

4 The _____ movement of the piston enables the transmission of the thermal energy into mechanical energy.

5 As well as the stationary parts, _____ parts also play an essential role in attaining propulsion power for the engine.

6 The air is compressed to provide the necessary _____ and to increase the _____ in order to produce energy in an internal combustion engine.

1 PARTS OF THE MAIN ENGINE

I. LEAD IN

The main engine of a vessel consists of moving and stationary parts.

Discuss what you know about parts of the main engine. Answer the following questions.

1 Have you ever been in the engine room of a vessel and seen the main engine?

2 What parts of a main engine do you know? What functions do they have?

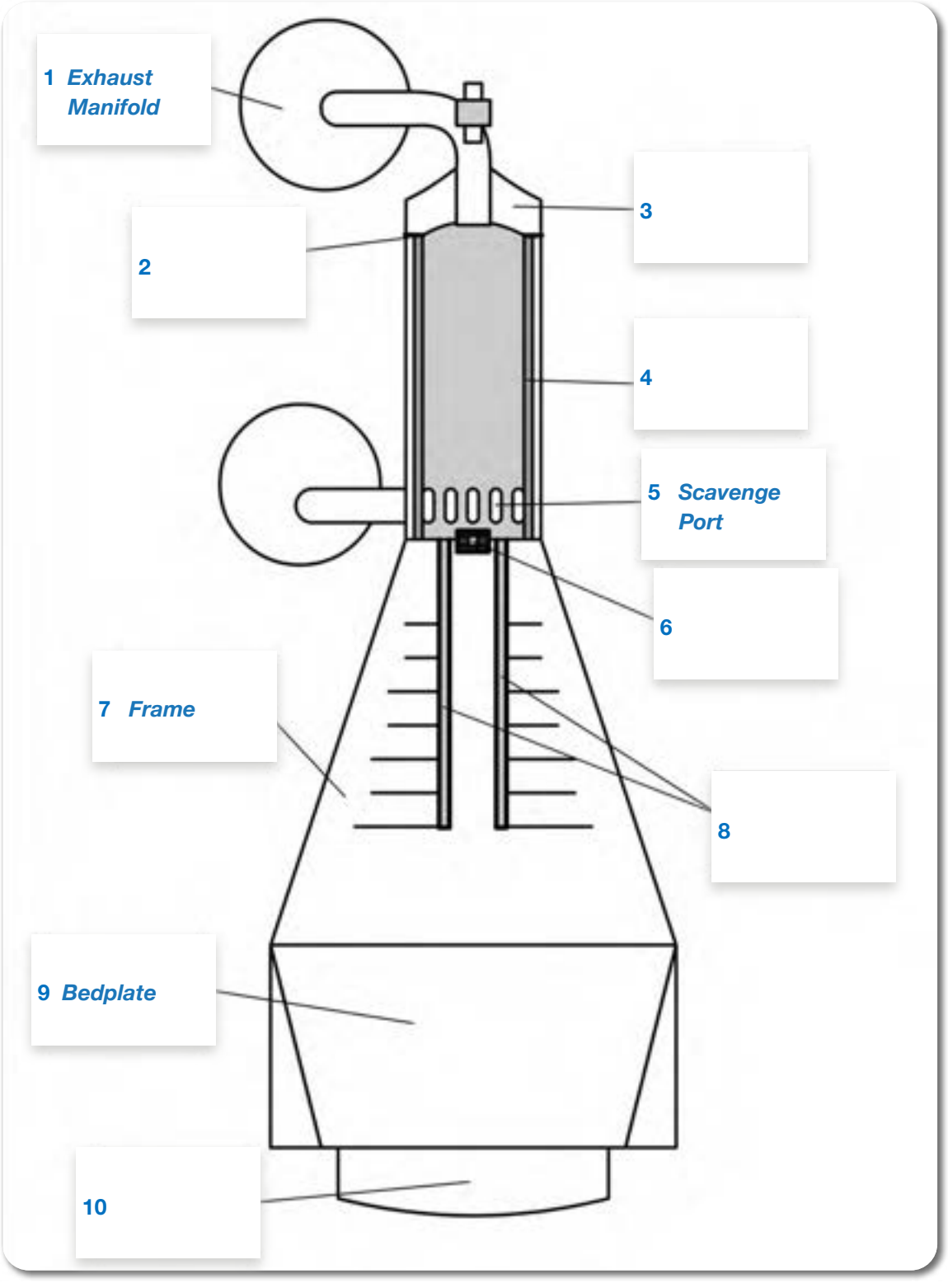
II. READING AND VOCABULARY

A Stationary engine parts form the basic structure of the main engine. Read the definitions and match them with their functions with your partner.

STATIONARY ENGINE PARTS	FUNCTIONS
1 **Cylinder block** is the main body of the cylinder.	A ____ It eases the movement of the piston in the cylinder and reduces wear due to friction.
2 **Cylinder head** is a kind of cover on the top of the cylinder.	B _6_ The crankcase lies in it.
3 **Cylinder head gasket** is the leakproof part between the cylinder head and the cylinder block.	C ____ It protects the crankshaft from external impacts.
4 **Cylinder liner** is a part of the cylinder block with a sliding surface in which piston moves. It has **scavenge ports** on it in two-stroke engines.	D ____ They let the fresh air in, and exhaust gases out.
5 **Stuffing box** is the component which separates the crankcase and the scavenge air space and prevent leakage.	E ____ It covers the cylinder and forms the combustion chamber.
6 **Bedplate** is a part of the main body.	F ____ They clean contaminants in the air, water and fuel in the engine.
7 **Crankcase** is at the bottom of the engine.	G _9_ It supports the engine and holds **crosshead guides** on it.
8 **Manifolds** are the canals which let the air in and out of the engine.	H ____ It forms a seal between the two, and prevents gas or liquid leakage.
9 **Frame** is the middle part of the engine.	I ____ It prevents lubricating oil steam from entering in the scavenge air space. Piston rod works in it.
10 **Filters** must be cleaned and replaced frequently as their purpose is cleaning.	J ____ It holds all the engine parts on it directly or indirectly.

4A MAIN ENGINES

B Work in pairs. Write the stationary parts of the main engine that you have learned in Exercise A on Page 125.



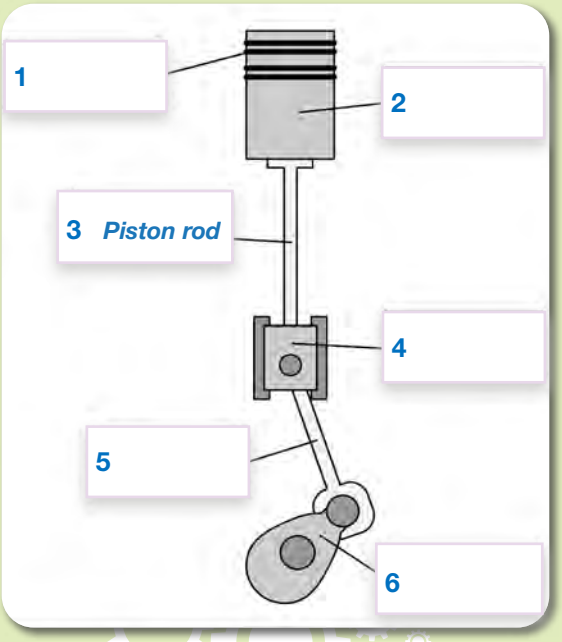
C Moving engine parts **are circular or linear moving parts of an engine. The interaction between these parts enables power transmission within the main engine.** Read the paragraphs about moving engine parts in a two-stroke engine. Work in groups and write the missing parts in the correct boxes.

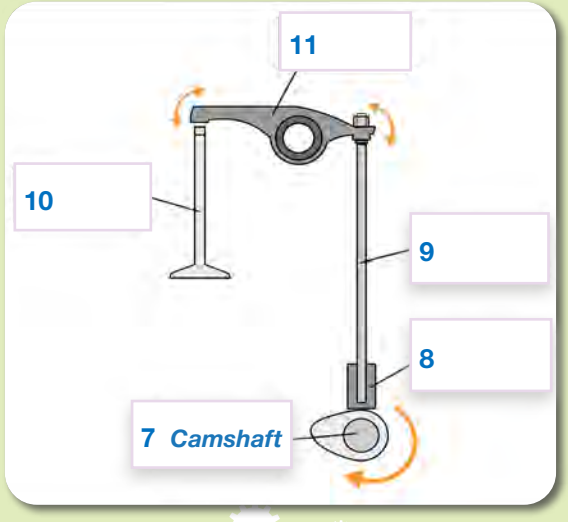
Piston is the linear moving part of a main engine by which the interaction between the moving parts is triggered. It transforms the thermal energy into mechanical energy.

Piston rings are leakproof components on the piston, which prevent leakage of air during compression or power strokes.

Piston rod and **connecting rod** transmit the motion of the piston to the crankshaft. There is a connecting rod alone in small engines; however, in larger, two-stroke engines there is a **crosshead,** which connects piston rod and connecting rod. It eliminates the lateral pressure of the piston within the cylinder.

Then, the motion is transmitted to the **crankshaft,** which transforms the linear motion into circular motion and transfers it to the related parts of the engine.





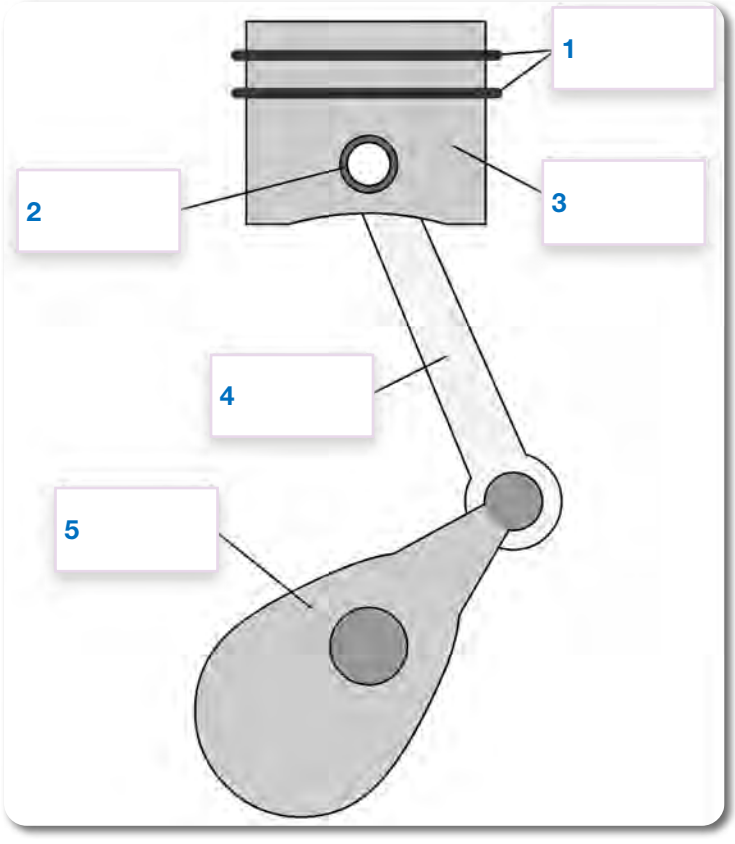
Camshaft takes over the circular motion from the crankshaft, and it opens and directs the timing of the valves.

Valves enable fresh air intake (in four-stroke engines) into the cylinder and exhaust scavenge. In two-stroke engines, there are ports instead of an intake valve.

If the camshaft is not directly connected to the valves, there is a mechanism which transmits the motion from the camshaft to the valves. This mechanism consists of a tappet, a push rod and a rocker arm. The motion is transmitted from the camshaft to the **tappet** first, then to the **push rod** and finally to the **rocker arm**. The rocker arm changes the direction of the motion and opens the valves.

III. WRITING AND SPEAKING

A You see a four-stroke engine's moving parts in the picture below. Write the names of the parts in the correct box.



Crankshaft
Gudgeon pin/Piston pin
Piston
Connecting rod
Piston rings

B Revise what you have learned about a two-stroke engine and a four-stroke engine and discuss the differences in the classroom.

e.g., *A two-stroke engine has a crosshead as a connecting part between the piston rod and connecting rod, but a four-stroke engine does not.*

C Work with your partner. Ask and answer the questions about the parts of the main engine as in the example.

e.g., *What/piston/do?* ***Student A:*** *What does a piston do?*
Student B: *It transforms thermal energy into mechanical energy.*

1 Where/piston/travel?
2 How/valves/open?
3 What/gudgeon pin/do?
4 What/connecting rod/do?
5 What kind of engines/have/crosshead?
6 How/combustion/occur/diesel engines?

2 TYPES OF THE MAIN ENGINE

I. LEAD IN Main engines can be **V engines** or **inline engines (I engines)** according to the layout of their cylinders. In terms of cycles, main engines are classified as **two-stroke** engines or **four-stroke engines**.

Discuss what you know about main engine types. Answer the following questions.

1 Do you know the types of main engines? What are they?

2 What do you know about the features of the main engine types?

II. READING AND VOCABULARY

A1 Read the paragraph defining the terms related to reciprocating internal combustion engines and write one of the terms written in bold for each abbreviation.

1 V_s _____

2 BDC _____

3 V_t _____

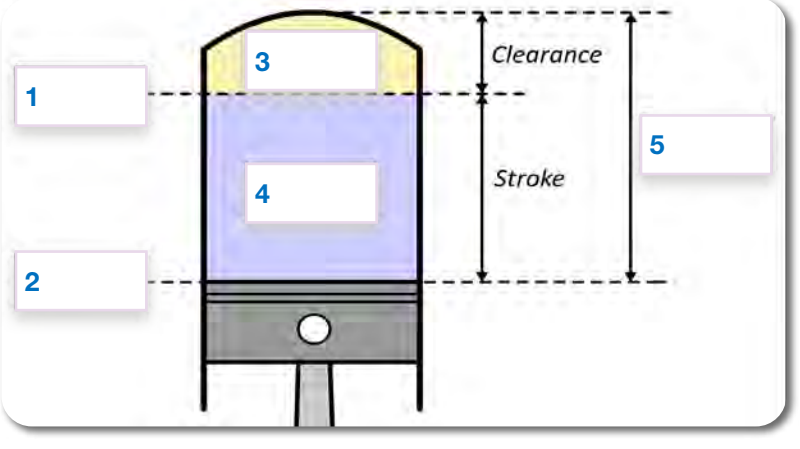
4 rc _____

5 TDC _____

6 V_c _____

In an internal combustion engine, the piston moves in a linear motion, and it pauses at two points to change its direction. These points are called dead centers. The uppermost point that the piston can go is **top dead center**, and the lowermost point is called **bottom dead center.** The volume between the two dead centers is called **stroke volume**. When the piston is at the top dead center, the volume between the cylinder cover and the top point of the piston head is called **combustion chamber volume**. The total volume of the two gives the **cylinder volume.** The ratio of cylinder volume to combustion chamber volume gives the **compression ratio** ($rc = V_t \div V_c$), which is an essential variable for engine performance.

A2 Read the paragraph in Exercise A1 again and write the abbreviations in the correct place on the picture.



4A MAIN ENGINES

B A cycle consists of four strokes in a four-stroke engine. Read the strokes of a four-stroke diesel engine's cycle on the left and match them with the events that happen during the strokes on the right.

A Intake Stroke ____

B Compression Stroke____

C Power Stroke____

D Exhaust Stroke____

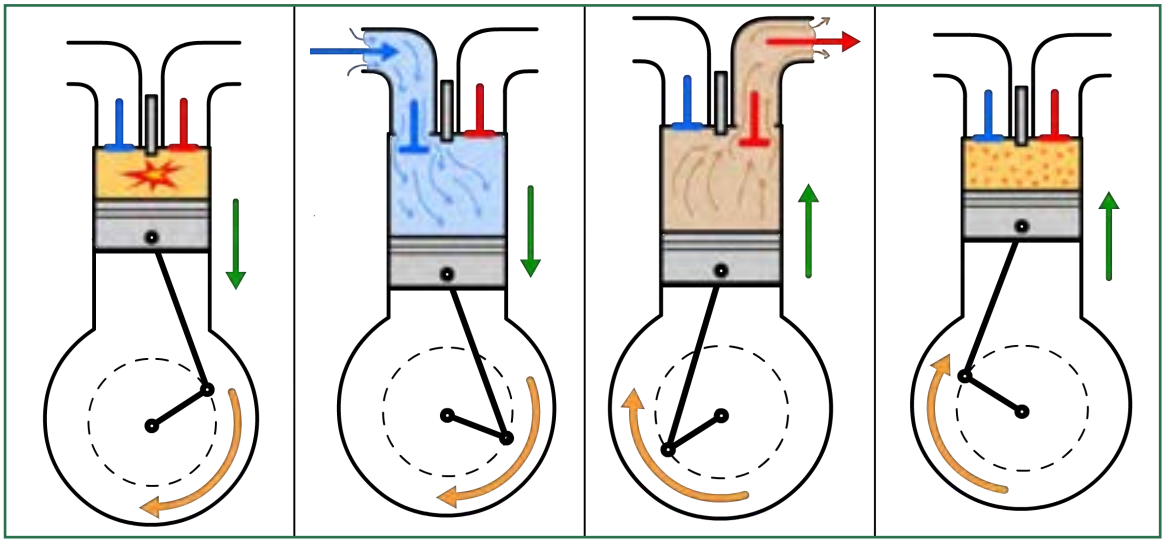
1 The piston moves upwards. Both intake and exhaust valves are closed; the air is compressed in the cylinder and its temperature and pressure increases. The fuel is injected into the cylinder, and it ignites as it contacts with the high-temperature, compressed air.

2 The piston moves upwards. The exhaust valve is open, and exhaust gases are pushed out of the cylinder.

3 The piston moves down. The intake valve is open and fresh air is taken into the cylinder. The cylinder is filled with air when the piston reaches at the BDC.

4 The piston is pushed down by the combustion power in the cylinder, and the power which runs the engine is produced in this way.

C Look at the pictures showing four strokes in a four-stroke diesel engine's cylinder. The strokes are NOT given in the correct order. Read the information in Exercise B and write the name of the correct stroke under each picture.



1_____ 2_____ 3_____ 4_____

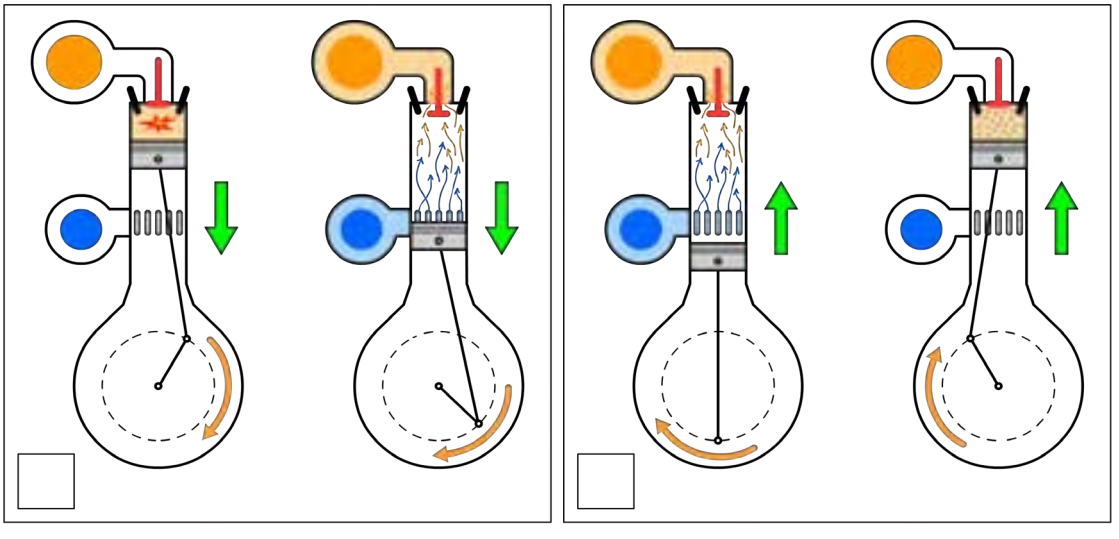
D1 A cycle consists of two strokes (compression and power strokes) in a two-stroke engine. Read the paragraphs describing these strokes and complete them with the correct words from the box on the left.

scavenge
exhaust
sprayed
closed
compressed
combustion

A As the piston moves from the BDC towards the TDC, both scavenge ports and _____ **(1)** valve are open, and intake and exhaust process continue. Before the piston arrives at the TDC, first scavenge ports, and then the exhaust valve are _____ **(2)**; thus, compression stroke starts.

B Through the end of the compression stroke, the fuel oil is _____ **(3)** and ignited due to its contact with the high-temperature and _____ **(4)** air. The piston is pushed down to the BDC with the effect of the _____ **(5)** in the cylinder; thus, power stroke takes place. Before the piston arrives at the BDC, first exhaust valve and then _____ **(6)** ports are opened, and scavenging takes place.

D2 Read paragraphs in Exercise D1 again and match them with the pictures below.



III. WRITING AND SPEAKING

A Read the sentences describing a cycle in a four-stroke and a two-stroke engine and write the sentences under the correct title with your partner.

FOUR-STROKE ENGINE	TWO-STROKE ENGINE
1	1
2	2
3	3
4	4
5	5

A A cycle is completed by four separate strokes of the piston.

B A cycle is completed when crankshaft completes a tour (360°).

C There is not an intake valve; there are scavenge ports instead.

D There is a piston rod and a crosshead to connect it to the connecting rod.

E Connecting rod is attached to the piston via a gudgeon pin.

F There is an intake valve to take fresh air in.

G A cycle is completed when crankshaft completes two combined tours (720°).

H A cycle is completed by two strokes of the piston.

I Fresh air intake and exhaust gas scavenge processes take place at different strokes.

J They take the fresh air in and emit the exhaust gas out of the cylinder at the same time.

B Work in groups. Discuss the advantages and disadvantages of four-stroke and two-stroke engines in terms of size, power, speed, cost etc.

e.g., *Two-stroke engines are more powerful than four-stroke engines.*

PROJECT In pairs make a research about advantages and disadvantages of two-stroke and four-stroke engines. Prepare a presentation comparing the two in terms of size, speed, power, cost etc.

INTRODUCTION

I. LEAD IN

Auxiliary means supporting or giving additional aid. Auxiliary engines, along the same line, help the main engine to operate properly and meet various needs of the vessel.

Share what you know about auxiliary engines with your classmates.

1 Which auxiliary engines do you know? What are they used for?
2 Have you ever been to a vessel and seen auxiliary systems? What are they?

II. VOCABULARY

A Circle the correct form of the words in bold to complete the sentences meaningfully.

1 The officer of watch (OOW) must make sure that an enclosed space is **ventilated/ ventilation** well before a crew member enters in.
2 **Flame/Flammable** substances must be kept away while welding.
3 A special type of oil is used to **lubricate/lubricating** moving parts of the engine.
4 Pipelines are like veins in our body which provide blood **circulate/circulation** to various organs.
5 In order not to cause any **confuse/confusion**, the manager explained each phase in detail in the meeting again and again.
6 **Standardise/Standardisation** of many aspects of maritime transportation and shipping is administered by certain international organisations.

B1 Match the halves to form meaningful collocations.

1 Auxiliary	_____codes
2 Waste	_____air
3 Compressed	_____water
4 Colour	_____media
5 Cooling	_____engines

B2 Write the correct collocations from Exercise B1 to complete the sentences.

1 _____ is obtained from sea water and fresh water.
2 _____ refers to general waste fluids flowing through the pipelines.
3 _____ can be used as standardised non-verbal signs.
4 _____ must be maintained regularly to be operational all the time.
5 _____ plays a key role in starting the main engine.

C Complete the sentences with the prepositions in the box.

1 The citizens of the region consist_____farmers and factory workers.
2 As a manager, I earn much more than before; on the other hand, I have less free time as I have to deal _____every issue in the company.
3 It is more difficult to put the fire_____than to start it; so, we must be more careful.
4 It seemed to be a nice day to sail, but suddenly a thunderstorm broke_____.

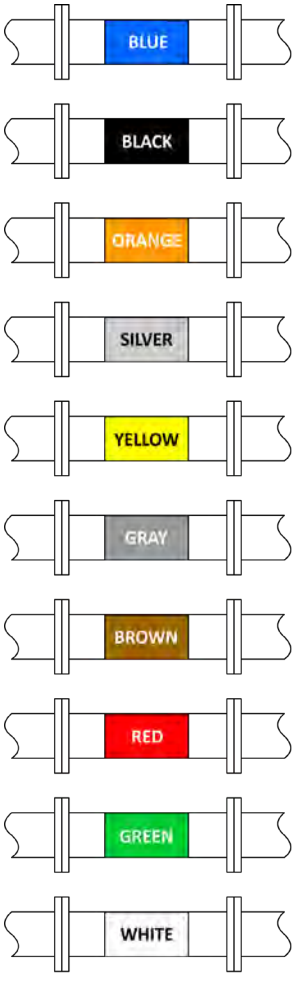
III. READING

A Read the paragraph and answer the questions.

The circulation of air, water, oil, and gases is supplied by pipelines on a vessel. Several pipelines are laid for the circulation of different materials, like fresh water, steam and fuel oil, which are used for various purposes. They are marked in different colours. Colour codes are standardised by ISO (International Standardisation Organisation) and each colour code represents a specific material.These colour codes are essential in eliminating the confusion and taking the right action immediately in unexpected situations.

1 What are pipelines used for on a vessel?
2 What kind of materials are circulated via pipelines?
3 What is the purpose in using colour codes on pipelines?
4 Who is the authority in standardisation of the colour codes for pipelines?

B In pairs, write the missing letters to complete the names of pipelines of a vessel next to the colour codes that represent them.



1 F__ __ __h W__ __ __r
2 W__s__e M__d__a
3 L__b__ __c__ __ __ __g O__ __
4 St__ __m
5 Fl__m__ __bl__ G__ __es
6 Non – Fl__m__ __bl__ G__ __es
7 F__ __l O__ __
8 F__r__-F_g__t__ __g
9 S__ __ W__ __ __ r
10 A__ __ V__ __t__l__t__ng

1 MAIN ENGINE SYSTEMS

I. LEAD IN Discuss the following questions with your classmates.

1 Do you know which systems help the operation of the main engine?

2 In what ways do you think these systems help the main engine to operate.

II. VOCABULARY

A Write three words in each group to form collocations.

double-bottom	sea	lube oil	settling	fresh
bilge water	service	cooling	fuel oil	

1 _____
2 _____
3 _____ } tank

4 _____
5 _____
6 _____ } water

7 _____
8 _____
9 _____ } separator

B Use the correct forms of the verbs from the box to complete the sentences.

cool	dump	treat	bilge	reach

1 A ship _____ very close to the coast, and it polluted the water badly although it is illegal.

2 The baby cannot drink hot drinks. You need to _____ the milk before you give her.

3 The rock made a tinkling sound when it _____ at the bottom of the lake in the cave.

4 All wastes must be _____ properly on a ship before they are _____ overboard.

C Match the phrases with their definitions.

Turning gear
Return pipe
Fire hydrant
Sea chest

1 _____ is a kind of pipe which is designed for taking overflowing fluids back to the service tank.

2 _____ is an underwater container with a strainer attached to the hull of the vessel which is used for seawater intake.

3 _____ is a kind of pipe which has a connecting point for hoses to get water to extinguish a fire.

4 _____ is an electrically operated gear which prepares the main engine for operation.

4B AUXILIARY SYSTEMS

III. READING

A Work in pairs. Read the paragraphs (A-G) describing the main engine systems and write their names (1-7) to complete the paragraphs.

1 Ballast system
2 Fire-fighting system
3 Cooling System
4 Lubricating System
5 Bilge system
6 Fuel Oil System
7 Starting Air System

A The main engine of a vessel is started using compressed air via _____. Following the turning gear, compressed air is taken into the cylinder to apply propulsive force on the piston. By the time the engine reaches to the required speed, the air is cut, and the oil is sent.

B Within the _____, fuel oil or diesel oil is first taken into the **double-bottom tank**. Then, it is rested and heated in the **settling tank**. Next, it is separated by **fuel oil separators** and sent to the **service tank**. After these processes, the oil is filtered, and ready-to-use oil is finally sent to the **injectors** via **fuel supply pump** and **injector pump**. Unused oil returns to the service tank again through the **return pipe**.

C Lubricating lines enable lube oil circulation in the main engine and lubricates the moving parts. A functional _____ ensures the main engine to be durable and work efficiently.

D In internal combustion engines, the temperature rises due to the combustion. It must be decreased and kept at a specific level. It is provided by circulating cooling water in the engine via _____.

E _____ is helpful in adjusting the draught of the vessel according to the cargo. Seawater is taken into or discharged from the ballast tanks via ballast pumps to maintain a proper draught level for the cargo to be carried safely.

F Seawater is taken from the sea chest and transferred to the fire hydrants in various parts of the vessel through pipelines within the _____. In case of a fire, fire hoses are connected to the fire hydrants and the water is released to put out the fire. Other than seawater; dry powder, CO_2 and foam are also used to extinguish different types of fires. This system must be maintained and kept available all the time in case a fire breaks out.

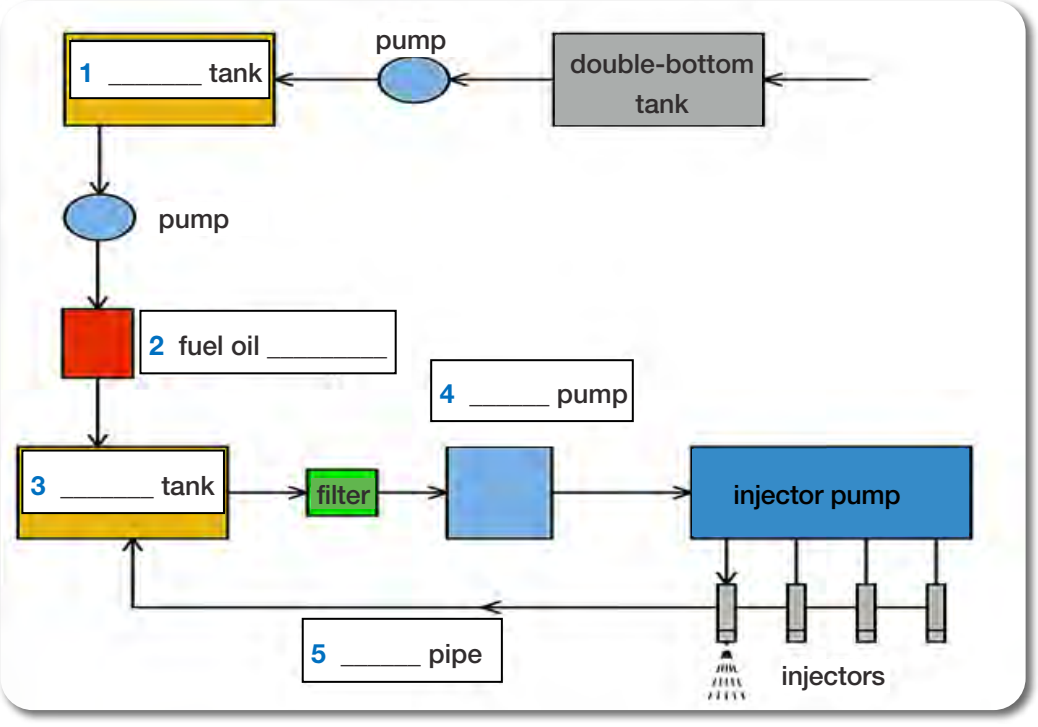
G _____ basically consists of pumps, tanks, a bilge water separator, various valves and filters to treat and store the waste water produced by the ship. The waste water can only be bilged when it is treated in accordance with the international conventions.

B Read the paragraphs in Exercise A again and write TRUE/FALSE next to the sentences.

1 Bilge water must be put through some processes before it is dumped overboard. _____
2 Fuel oil is directly sent to the cylinder to ignite the compressed air. _____
3 Ballast system deals with waste treatment. _____
4 Lubricating system prolongs the engine components' lives. _____
5 The main engine is started using compressed air. _____
6 Starting air system is used for cooling purposes. _____

IV. WRITING

A Read the paragraph related to the fuel oil system on Page 136 again and complete the parts of the system, written in bold, on the picture below.



B Write the functions of the main engine systems in the correct line on the table.

MAIN ENGINE SYSTEM	FUNCTION
1 Starting Air System	
2 Fuel Oil System	
3 Lubricating System	
4 Cooling System	
5 Ballast System	
6 Fire-fighting System	
7 Bilge System	

A It ensures that a possible fire can be extinguished with the vessel's own means.
B It generates the starting motion for the main engine.
C It maintains the engine temperature at a specific level.
D It prepares the fuel oil to be used in the main engine.
E It is essential to ensure a safe cargo transportation.
F It is used for storage and treatment of the bilge water.
G It prevents wear on moving parts due to friction.

2 AUXILIARY ENGINES AND OTHER SYSTEMS

I. LEAD IN

Several auxiliary systems work on a vessel with various functions which are essential for the proper working of the main engine and engine components.

Share your views and knowledge with your classmates. Discuss the following questions.

1 What other auxiliary systems and engines do you know? How do they run?
2 What are they used for?

II. READING AND VOCABULARY

A In pairs, read the sentences about the functions of the auxiliary systems and complete them with their names given in the box.

Oil Purifiers
Air Compressors
Pumps
Valves
~~Generators~~
Incinerator
Heat Exchangers
Boilers

1 ___*Generators*___ produce electricity for the vessel.

2 _____ enable fluids such as bilge water, ballast water, and fuel oil to move in the pipelines throughout the vessel with a specific pressure and flow rate.

3 Hot steam, which is used in various areas such as heat exchangers, accommodation and tanks, is produced by boiling the liquids in _____.

4 _____ control or change the direction, pressure or flow of the fluids in the system.

5 An _____ is a kind of furnace in which the wastes are burned in compliance with international conventions.

6 _____ separate water and sludge from the oil and fuel oil by using centrifugal force; and then, send clean oil or fuel oil to the related line.

7 _____ are used for heating or cooling fluids such as oil, fuel oil, water and air.

8 _____ compress the air to be stored in the air tanks, which is later used as a starting air for the main engine and pneumatic systems.

B Complete the sentences about the auxiliary systems with a word from the box.

centrifugal	**ash box**	**reciprocating**	**garbage**	**incineration**

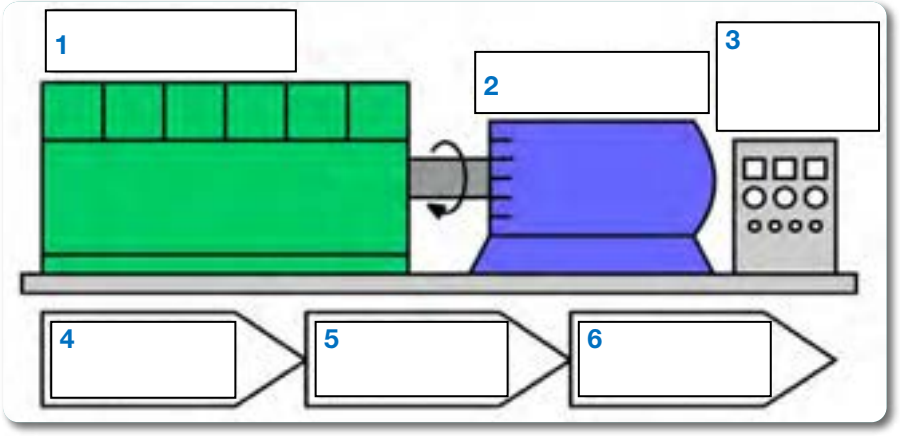
- The _____ **(1)** process is recorded in the _____ **(2)** record book, and the ashes are collected in the _____ **(3)**.
- Pumps have various types such as gear ,_____ **(4)**, or _____ **(5)**.

C1 Read the paragraph about generators and write the correct forms of the verbs given in the box to complete it.

be	convert (x2)	produce	send (x2)	consist

Generators _____ **(1)** electricity for the vessel. A basic generator _____ **(2)** of a **diesel engine**, an **alternator**, and a **control panel**. The diesel engine _____ **(3)** **thermal energy** into **mechanical energy** and it _____ **(4)** the mechanical energy to the alternators. Alternators _____ **(5)** mechanical energy into **electrical energy**, and _____ **(6)** it to the electric systems of the vessel. On the control panel of the generator, there _____ **(7)** indicators for different values of produced electricity.

C2 Read the paragraph in Exercise C1 again and complete the diagram using the phrases in bold.



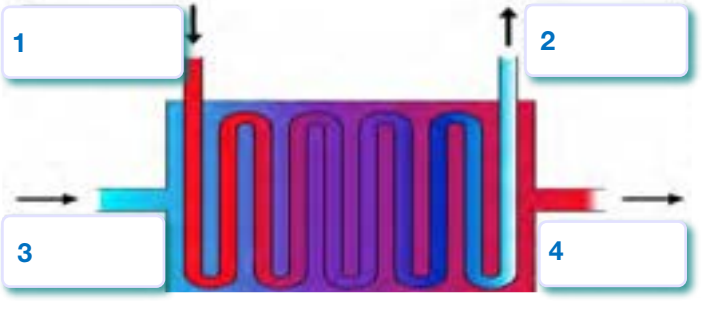
D1 Read the paragraph about heat exchangers below and complete it with a word from the box.

sea water	steam	fluids	resistances	heaters

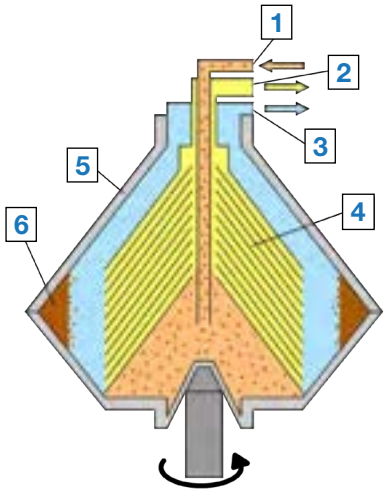
Heat exchangers are coolers, or _____ **(1)** which are used for heating or cooling certain _____ **(2)** such as oil, fuel oil, water and air. Coolers use _____ **(3)** or fresh water for cooling; heaters use _____ **(4)** or hot water from the main engine, or electric _____ **(5)** for heating.

D2 Read the paragraph in Exercise D1 again and write the correct phrases from the box on the picture of a heat exchanger below.





E You see a picture of an oil purifier below. Study the picture carefully and write the correct number next to the terms defining the parts of the oil purifier.



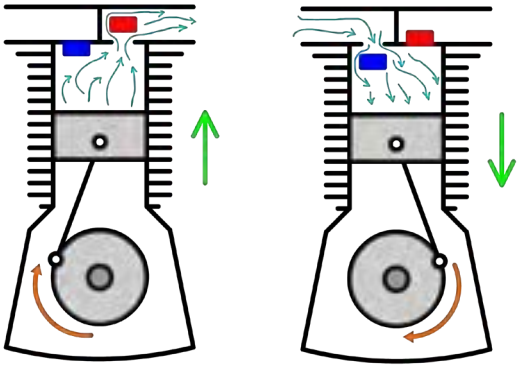
_5_ Bowl
_____ Water outlet
_____ Oil inlet
_____ Discs
_____ Sludge
_____ Clean oil outlet

F Reciprocating air compressors are actuated by the movement of the piston between TDC and BDC. Read the sentences about the two strokes of Reciprocating air compressors and match the pictures with the paragraphs.

_____ **A** While the piston is moving towards BDC, suction valve is opened and discharge valve is closed; in this way, air fills in the cylinder. This is called the **suction stroke**.

_____ **B** While the piston is moving towards TDC suction valve is closed and discharge valve is opened; in this way, the air is sent to the storage tanks. This is called the **discharge stroke**.

1



2

ABBREVIATIONS

1 **ISO:** International S_____Organisation
2 **OOW:** Officer of W_____

PROJECT Visit the engine room of a ship, in groups, and find the main engine and some auxiliary systems you have learned. Prepare a presentation to introduce them in the classroom with your own words and sentences.

I. LEAD IN Discuss the following questions in the classroom.

1 Do you know what kind of information is recorded in the engine log book?
2 What can be the purpose of keeping engine room record books?

II. READING

A1 Read the text about engine room records and complete with a word from the box.

breakdown	**boilers**	**log book**	**garbage**
sounding	**auxiliary**	**consumption**	**watch**

ENGINE LOG BOOK AND OTHER RECORDS

Operating values of the main engine systems and _____ **(1)** engine systems are recorded in the engine_____ **(2)** at certain intervals. Engineer Officer of the_____ **(3)** (EOOW) records the following values in the engine log book properly:

- Pressure and temperature values of the main engine,
- Exhaust gas temperatures of cylinders at the starboard and the port,
- Temperature and pressure values of the generators and the_____ **(4)**,
- Working hours of the main engine, the generators, and the boilers,
- Values for fuel oil and lubrication oil _____ **(5),**
- Working and cleaning hours of the seperators,
- Tank_____ **(6)** values,
- Temperatures and running hours of the refrigerator,
- Engine room temperature and pressure.

Log book recordings include information for the condition of these systems. Changes in the values of these systems are important to indicate a possible failure. In addition to the engine log book, oil record book, _____ **(7)** record book, service and maintenance record books are other documents for the records of the engine room. Keeping all these records regulary is essential for various reasons as such they might be required during surveys, they can be useful in detecting a possible engine _____ **(8)** at an early stage, and for insurance mattters in case of an accident.

A2 Read the text in Exercise A1 again and answer the questions.

1 Who is in charge of the engine log book entries?
2 What is recorded in the engine log book regularly?
3 What other record books are used in the engine room?
4 Why is recording certain information about the engine systems so important?

B Engine room checks are carried out regularly to keep the vessel operational and to prevent troubles due to failures. Read the sentences about the engine room checks and complete them with the given words.

compressors	pneumatic	operational	charge	leakage	chest
generators	adequate	exchanger	room	pumps	full

1 Pipelines are checked to detect if there is a _____.
2 Fire _____ and fire pipes are tested to make sure that they are operational.
3 Hydraulic and _____ pipelines are checked to detect if there is a leakage.
4 Heat _____ temperature is checked to make sure that it is maintained.
5 Sea _____ valves are checked to make sure that they are operational.
6 Pumps in the engine room are checked to make sure that they are _____ .
7 Main engine and _____ are checked to detect if there is a leakage of oil or water.
8 Ventilation in the engine _____ is checked to make sure that it is adequate.
9 Air _____are checked to make sure that they are operational.
10 Air receivers' levels are checked to make sure that they are _____ enough.
11 Batteries are checked for the _____levels.
12 Ventilation in the battery room is checked to make sure that it is _____.

III. WRITING

A1 The engine log book entries for the main engine pressures and temperatures are shown on the table below. Work in pairs and complete the missing parts with the given words.

TEMPERATURES	WATER	STARTING	EXHAUST
LUBRICATION	PUMP	REVOLUTION	SEA

EOOW	(1) PER MINUTE (RPM)	PRESSURES					_____(7)					MAIN ENGINE (PORT)			
		FUEL (2)	(3) AIR	(4) OIL	PISTON COOLING LUBRICATION	COOLING (5)	(6) WATER	COOLING WATER		LUBRICATION OIL			Temperature of the Cylinder's _____(8) Gas			
								BEFORE COOLER	AFTER COOLER	BEFORE COOLER	AFTER COOLER	PISTON COOLING	1	2	3	4
00-04	A	6 bar	30 bar	B	2,5 bar	3 bar	25 °C	C	60 °C	85 °C	D	70 °C	400 °C	E	390 °C	400 °C
04-08																
08-12																

A2 Complete the missing information (A-E) on the table in Exercise A1 with the values given in the box below.

65°C	80°C	80 RPM	410°C	2 bar

B Complete the missing phrases on the second page of the engine log book about the generator and boiler operations on the table below with the given words.

WORKING	BOILER	COOLING	STARBOARD
GENERATOR-1	LUBRICATION	TEMPERATURE	PRESSURE

MAIN ENGINE _____ (1)				_____ (2)				GENERATOR-2				PORT GENERATOR				_____ (3)	
Temperature of the Cylinder's Exhaust Gas																	
1	2	3	4	EXHAUST _____ (4)	LUBRICATION OIL _____ (5)	LUBRICATION OIL TEMPERATURE	_____ (6) WATER TEMPERATURE	EXHAUST TEMPERATURE	_____ (7) OIL PRESSURE	LUBRICATION OIL TEMPERATURE	COOLING WATER TEMPERATURE	EXHAUST TEMPERATURE	LUBRICATION OIL PRESSURE	LUBRICATION OIL TEMPERATURE	COOLING WATER TEMPERATURE	(8) HOURS	PRESSURE
400 °C	420 °C	395 °C	405 °C	300 °C	2 bar	3 °C	75 °C	320 °C	2,7 bar	3,2 °C	70 °C	310 °C	3 bar	2,5 °C	80 °C	5 h	8 bar

IV. VOCABULARY

A Choose the correct form of the words to complete the sentences.

1 These machines **consume/consumption** too much energy, so they are costly.
2 We attain domestic water using a **separate/separator** to clean the water from the mud.
3 We have to keep this window open to **ventilate/ventilation** the room well enough.
4 **Revolve/Revolution** per Minute (RPM) gives us the speed of the engine.

B Match the words with their definitions.

1 failure	_____	a	a period of time between two events
2 adequate	_____	b	operated by means of pressured air or gas
3 value	_____	c	numerical quantity of something
4 interval	_____	d	operated by means of oil, water, etc
5 pneumatic	_____	e	enough
6 hydraulic	_____	f	breakdown

ABBREVIATIONS Write the correct word to complete the long form of the abbreviations below.

1 **EOOW:** _____ Officer of Watch.
2 **RPM:** _____ per Minute.

PROJECT Work in pairs. Find an empty engine log book page. Prepare a presentation telling what kind of information is recorded on that page in detail. Imagine that you are an EOOW and fill in it with estimated values with your partner.

SELF ASSESSMENT 4	1	2	3
1 I can tell the basic stationary and moving parts of the main engine.			
2 I can talk about the basic working principle of a diesel engine.			
3 I can tell the basic functions of auxiliary systems in an engine room.			
4 I can show the basic parts of an engine on the picture.			
5 I can talk about diesel engine types and their working systems.			
6 I can tell what kind of technical reports are kept in the engine room.			
7 I can talk about essential recordings in the engine log book.			

REVISION 4

A Match the words with their definitions.

1 combustion	_____	a	to move forwards and backwards in a linear motion
2 wear	_____	b	to move in a circular orbit, to rotate
3 reciprocate	_____	c	the flow of a fluid in a pipe, hose, or a vein in a system
4 revolve	_____	d	damage due to friction
5 circulation	_____	e	burning

B Complete the sentences with a word with your partner. The first letters are given.

1 Combustion takes place in the **c**_____ in an internal combustion engine.
2 In one stroke, the **p**_____ completes one full travel in the cylinder.
3 The **c**_____ connects the piston rod to the connecting rod.
4 A **c**_____ consists of four strokes in a four-stroke engine.
5 The cylinder **l**_____ reduces wear due to friction.
6 The **c**_____ protects the crankshaft from external impacts.
7 The **s**_____ box separates the crankcase and the scavenge air space.
8 The **r**_____ arm opens the valves if the camshaft is not directly connected to the valves.

C Match the auxiliary systems with their functions.

1	Air Compressors	_____ a	heat or cool the fluids as needed.
2	Generators	_____ b	separate water and sludge from the oil.
3	Boilers	_____ c	are used for waste burning.
4	Incinerators	_____ d	arrange the flow rate and pressure of fluids in the pipelines.
5	Pumps	_____ e	compress the air.
6	Oil Purifier	_____ f	direct the flow of the fluids in the pipelines.
7	Heat Exchangers	_____ g	are used for hot steam production.
8	Valves	_____ h	produce electricity for the vessel.

D Find the **compression ratio (rc),** using the given information below.

Combustion chamber volume (V_c): **0,001 m³**

Cylinder total volume (V_t): **0,020 m³**

rc = _____

E Choose the correct item.

1 _____ is NOT one of the strokes in a four-stroke engine?

A Intake
B Exhaust
C Compression
D Separation

2 The propulsion is produced during _____ stroke.

A power
B compression
C intake
D exhaust

3 There are _____ and _____ strokes in two-stroke engines.

A intake/compression
B compression/power
C intake/exhaust
D power/exhaust

4 Seawater pipes are indicated with _____ colour according to the standard pipe marking system.

A blue
B black
C green
D white

5 Brown is the main colour of _____ pipes according to the standard pipe marking system.

A fuel oil
B waste media
C lube oil
D sea water

6 The colour of flammable gas pipes is _____ according to the standard pipe marking system.

A black
B yellow
C brown
D gray

7 _____ gives the starting motion for the main engine.

A Ballast system
B Lubricating system
C Bilge system
D Starting air system

8 _____ maintains the main engine's temperature at an ideal level.

A Bilge system
B Cooling system
C Fire-fighting system
D Fuel oil system

9 Records for incineration is kept in the _____ on a vessel.

A oil record book
B maintenance record book
C garbage record book
D engine log book

10 _____ is NOT recorded in the engine log book.

A Engine room temperature
B Generator working hours
C Condition of the LSA
D Exhaust gas temperatures



5 STANDARD MARINE COMMUNICATION PHRASES

In this unit, you will...

- get familiar with the basics and application of SMCP
- get familiar with the terms and phrases used in SMCP
- recognise distress/urgency/safety messages from other ships
- learn to send distress/urgency/safety messages to other ships
- learn to answer distress/urgency/safety messages

5 STANDARD MARINE COMMUNICATION PHRASES
5A SMCP BASICS

INTRODUCTION

I. LEAD IN Discuss the following questions with your classmates.

1 Why do you think seafarers need standard phrases for communication?
2 Do you know any standard marine communication phrases? If yes, what are they?

II. READING AND VOCABULARY

STANDARD MARINE COMMUNICATION PHRASES

Standard Marine Communication **Phrases** (SMCP) have been adopted to standardise the language in marine **communication** at sea, in port-approaches, in waterways, harbours and on board to maintain safe navigation and operations.

SMCP meet the requirements of STCW and SOLAS conventions, regarding **verbal** communications. They do not replace or contradict with any international regulations such as COLREG or the International Code of Signals (ICS) as set out in the International Telecommunication Union (ITU) regulations and recommendations made by IMO. They are accepted as a safety language, using a **simplified** version of maritime English to avoid any misunderstandings that occur when **precise** meanings and **translations** are not clear among **multilingual** crew and workers in the field of maritime.

A Read the text and match the definitions with the highlighted words in the text.

1 _____: able to use more than two languages
2 _____: very careful and accurate
3 _____: spoken rather than written or relating to words
4 _____: less complicated so easier to do or understand
5 _____: a group of words forming a part of a sentence
6 _____: activity of changing the words from one language into another
7 _____: exchanging information by speaking, writing or using some other means

B Use the highlighted words to complete the sentences below.

1 Students at 6th grade will read a _____ version of Oliver Twist this year.
2 This is a _____ conference; so, some speakers.
3 You need to change some _____in this writing to make them clearer.
4 It's always difficult to make _____ of idioms due to cultural differences.
5 Mimics and gestures are often used to support _____ messages.
6 Means of_____ have changed greatly due to technological developments.
7 There is no _____ recipe for this dish; you can add other ingredients.

III. SPEAKING AND WRITING

CODES AND SPELLING

A Alphabetical and numeric code charts are used to exchange information in marine communication. Study the charts, notice that the underlined syllables are stressed and practice saying them.

LETTER	CODE	LETTER	CODE
A	Alfa	**N**	November
B	Bravo	**O**	Oscar
C	Charlie	**P**	Papa
D	Delta	**Q**	Quebec
E	Echo	**R**	Romeo
F	Foxtrot	**S**	Sierra
G	Golf	**T**	Tango
H	Hotel	**U**	Uniform
I	India	**V**	Victor
J	Juliet	**W**	Whisky
K	Kilo	**X**	X-ray
L	Lima	**Y**	Yankee
M	Mike	**Z**	Zulu

FIGURE	CODE WORD	PRONUNCIATION
0	Zero	ZEERO
1	One	WUN
2	Two	**TOO**
3	Three	**TREE**
4	Four	**FOWER**
5	Five	**FIFE**
6	Six	SIX
7	Seven	SEVEN
8	Eight	AIT
9	Nine	**NINER**
1000	Thousand	**TOUSAND**

B Look at the example reporting a vessel's identification information and practice identifying the vessels below.

ANDROMEDA
816947200
2DZA

This is eight-one-six-nine-four-seven-two-zero-zero
Motor vessel "ANDROMEDA" Alfa November Delta Romeo Oscar Mike Echo Delta Alfa
Call sign Two Delta Zulu Alfa

1 **STREAMLINE**
300784200
9HZS

2 **BARBAROS**
425068900
TAZB1

3 **SUNSHINE**
986430200
S6ZSS

C Write down the identifications of the vessels in Exercise A in full form as in marine communication.

1 _____

2 _____

3 _____

5A SMCP BASICS

1 PROCEDURE AND APPLICATION OF SMCP

I. LEAD IN

You send the following message when it is necessary to indicate that the SMCP are to be used:

"Please use Standard Marine Communication Phrases."
"I will use Standard Marine Communication Phrases."

II. READING AND WRITING

A Read the text and write the numbers in words.

According to SMCP, we say numbers in separate digits when talking about temperature, pressure, distance, positions, bearings, speed etc. For example, for **150.5** we say **"one-five zero point five"** or **"one-five-zero decimal five"**. We say "four-five degrees one-five decimal five minutes North - zero-three-two degrees one-seven decimal five minutes East" when telling the position 45° 15.5' N - 032° 17.5' E. We use full numbers in wheel orders, e.g., we say **"ten"** for **10**, or **"twenty-five"** for **25** for rudder angles. We use full numbers for dates and time, as well, e.g., we say **twenty-three**, **December**, **eleven** for **23/12/2011**; and we say **eighteen fifteen** for **18.15 UTC** (Universal Time Co-ordinated).

When you send a **GMDSS** (Global Maritime Distress and Safety System) message, you spell the vessel's name using the maritime alphabet, and say the Call Sign and **MMSI** (the nine-digit Maritime Mobile Service Identity Number) using separate digits. A few digits and numbers have a modified pronunciation compared to general English.

1 **Temperature:** 6° C (Celsius) _____
2 **Position:** 15°20' S (South) - 030°10' E (East) _____
3 **Distance:** 4.1 nm (nautical miles) _____
4 **Bearing:** 125° _____
5 **Atmospheric pressure:** 985 mb (millibar) _____
6 **Date:** 30/05/21 _____
7 **Speed:** 30.5 kt (knots) _____
8 **Time:** 13.30 UTC _____

B Read the information on the table below and write the time in full as used in marine communication. Then, practice saying the sentences.

TELLING THE TIME: At sea, times should be expressed in the **24-hour UTC** notation. In order to avoid a.m. (ante-meridiem=before noon) p.m. (post-meridiem=after noon) confusion we use 24-hour digital clock system.

e.g.	We write	We say
4 p.m.	*1600*	*sixteen hundred hours*
4 a.m.	*0400*	*zero four hundred hours or zero four zero zero hours*
14:15	*1415*	*fourteen fifteen*
18:05	*1805*	*eighteen zero five*

1 My ETA (Estimated time of arrival) at pilot station is at 1.00 a.m.
_____
2 My ETD (Estimated time of departure) from the port is at 11.20 a.m.
_____
3 You can take pilot at 12.15 p.m.
_____
4 Loading starts at 7.05 a.m.
_____
5 Loading finishes at 1.55 p.m.
_____

III. SPEAKING AND WRITING

A Match the responses silip with their meanings.

RESPONSES	THEIR MEANINGS
1 Yes ___	a Information requested is not immediately available
2 No ___	b Affirmative response
3 Stand by ___	c Negative response
4 No information ___	d Negative answer
5 I will/can ___	e Affirmative answer
6 I will not/cannot ___	f Information requested cannot be obtained

B1 AMBIGUOUS WORDS: In marine communication we avoid using modal verbs that may cause confusion. Match the marine communication phrases with the daily usage. Then say which one is a QUESTION, ANSWER, INTENTION, ADVICE or WARNING.

DO NOT SAY:	SAY:
1 May/Can I join the convoy? ____	a You are running into danger.
2 I might join the convoy. ____	b Yes, you have permission to join the convoy.
3 You should anchor in anchorage B3. ____	c Do I have permission to join the convoy?
4 Yes, you may/can join the convoy. ____	d I will join the convoy.
5 You could be running into danger. ____	e Anchor in anchorage B3.

B2 Study the table in Exercise B1 again and write the sentences on the table below as in the example.

DO NOT SAY:	SAY:
1 Can I anchor?	
2 You may moor at berth one.	
3 You may not pass on my port side.	
4 You could be running into storm.	
5 You should pass ahead of vessel Ocean.	

ABBREVIATIONS

Write the abbreviations in full forms:

1 **STCW:** Standards _____
2 **UTC:** Universal _____
3 **COLREG:** Convention _____
4 **ITU:** International _____
5 **GMDSS:** Global _____
6 **MMSI:** Maritime _____
7 **ETA:** Estimated _____
8 **ETD:** Estimated _____

PROJECT Research why and how SMCP were established and how they are used. Present the information you have gathered to your class. You can use posters, charts and pictures in your presentation.

5B ONBOARD COMMUNICATION

INTRODUCTION

I. LEAD IN

Onboard communication phrases may assist seafarers in meeting basic onboard communication requirements and may be regarded as useful for Maritime English instruction.

Discuss the following question with your classmates.

Why do you think crew members need to exchange information using SMCP with each other?

II. READING AND VOCABULARY

A Read the briefings given by an officer before handing over the watch. Match them with their categories: position, movements, draught, traffic situation in the area, meteorological conditions, radio communications, navigational aids and equipment.

	PHRASES	CATEGORIES
1	Port side radar is 6 nautical miles ***range*** scale.	***navigational aids and equipment***
2	The wind is West-Northwest force Beaufort 2.	
3	Present maximum draught is 7.5 metres.	
4	There is ***heavy*** ferry traffic across the strait.	
5	True course is 230°.	
6	ETA at the port channel is 0700 hours UTC.	
7	Starboard radar is at 12 nautical miles.	
8	NAVTEX (Navigational Telex) is switched on.	
9	We are entering Istanbul Strait.	
10	GPS (Global Positioning System) is in operation.	
11	Speed through water is 14 knots.	
12	A smooth sea is expected within two hours.	
13	Pilot station is on VHF (Very High Frequency) channel 11.	
14	Present position is 41°15' North, 029° 09' East.	
15	DSC (Digital Selective Calling) controller is ***switched on***.	
16	The radar is at the relative head-up ***display***.	
17	A vessel is taking South-west of us.	

B1 Match the highlighted words in the table with their synonyms.

1 _____ = radius
2 _____ = turned on
3 _____ = indicator
4 _____ = busy

B2 Use the highlighted words with their correct forms.

1 _____ DSC and follow VHF channel 11 for further information.
2 There is oil spillage in this area within _____ of 1 nm.
3 The _____ traffic in the fairway causes unplanned delays.
4 The _____ cannot be read due to a technical problem.

1 CREW COMMUNICATIONS ON BOARD

I. LEAD IN Discuss the following question with your classmates.

What kind of information do you think crew members exchange using SMCP?

II. READING

A Read the text below and complete it with the given words in the box.

danger	**watchkeepers**	**alarmed**	**contact**	**amidships**	**imminent**

Attention! All crew members. This is your Captain.

We have grounded in _____ **(1)**. There is no _____ **(2)** danger to crew or vessel and there is no reason to be _____ **(3).** All officers report to the bridge. _____ **(4)** remain at stations until further order. As soon as I have further information, I will make another announcement. There is no _____ **(5)** at this time. We also have radio _____ **(6)** with other vessels and coast radio stations.

B Read the exchange between the bridge and the engine room after grounding. Complete the missing parts with the sentences given in the box.

What is nature of sea bottom?	Check flooding and report.
Stand by engine room and report.	What is sea state?
Report damage.	What is state of tide?
Is danger imminent?	What is wind force and direction?

Bridge :_____**(1)**
Engine Room: Minor cracks in plating.
Bridge :_____**(2)**
Engine Room: No flooding.
Bridge :_____ **(3)**
Engine Room: No, danger not imminent.
Bridge :_____ **(4)**
Engine Room: Sea bottom rocky.
Bridge :_____ **(5)**
Engine Room: Tide one metre.
Bridge :_____ **(6)**
Engine Room: Wind force Beaufort 4 from North.
Bridge :_____**(7)**
Engine Room: Sea slight.
Bridge :_____**(8)**
Engine Room: Standing by engine room.



C Read the briefing phrases given by the deck officer and match them with the titles.

Phrases	Briefing on...
1 Port, steer three zero five ____	a navigational aids and equipment status
2 The log books are completed and signed ____	b temperatures, pressures, soundings
3 Stand by the pilot ladder _____	c radiocommunications
4 A vessel is passing on port side ____	d operation of main engine and auxiliary equipment
5 Navigation lights are switched on ____	e bridge organisation
6 NAVTEX is switched on ____	f meteorological conditions
7 The wind has changed from N (North) to NE (Northeast) ____	g pilotage
8 The helmsman is standing by____	h record keeping
9 Do not exceed a pressure of 10 mb ____	i traffic situation in the area
10 There are problems with auxiliary engines ____	j course to be steered

III. VOCABULARY

A The Chief Officer is talking with the engine room. Fill in the missing parts with the words from the box.

closed bilge	listing sea water	control stand by	engine room imminent	damage control switched on

Engine Room: We have flooding in the _____ **(1)**!
Chief Officer: What is flooding?
Engine Room: Flooding from _____ **(2)** pipes.
Chief Officer: Is danger _____ **(3)**?
Engine Room: Yes, danger of _____ **(4)**.
Chief Officer: Switch on extra power supplies and report.
Engine Room: Power supplies are _____ **(5)**.
Chief Officer: Close watertight doors and report.
Engine Room: Watertight doors are _____ **(6)**.
Chief Officer: Switch on _____ **(7)** pumps and report.
Engine Room: Bilge pumps are switched on.
Chief Officer: Is flooding under_____ **(8)** yet?
Engine Room: Yes, flooding is under control.
Chief Officer: _____ **(9)** in the engine room and start _____ **(10)**.

B Match the words to form collocations.

1 heavy ___	a area
2 damage control___	b danger
3 engine room ___	c pumps
4 closed ___	d listing
5 sea water ___	e team
6 imminent ___	f position
7 stand by ___	g watchkeeping
8 bilge ___	h suction valves

IV. WRITING

The Chief Officer is talking to the bridge on fire-fighting drill. Put the sentences in the correct order to form a conversation.

Chief Officer: ***Fire in accommodation! Smoke from ventilators.*** **(1)**
Bridge : _____ **(2)**
Chief Officer: _____ **(3)**
Bridge : _____ **(4)**
Chief Officer: _____ **(5)**
Bridge : _____ **(6)**
Chief Officer: _____ **(7)**
Bridge : _____ **(8)**
Chief Officer: _____ **(9)**
Bridge : _____ **(10)**
Chief Officer: ***Minor damage in provisions.*** _____ **(11)**

~~Minor damage in provisions.~~
Is smoke toxic?
Report damage.
Yes, fire under control.
Provision stores on fire.
No casualties, two injured.
Is fire under control?
No, not toxic.
What's on fire?
Report casualties.
~~Fire in accommodation!~~
~~Smoke from ventilators.~~

V. SPEAKING

Imagine there is flooding on the ship. Write a similar dialogue indicating location, reason, casualties and damage. Then, act out with your partner.

Chief Officer: There is flooding….

Bridge: Where is.....

2 PASSENGER CARE PHRASES

I. LEAD IN Passenger care phrases help masters, officers and crew members of passenger vessels to inform passengers on safety aspects and to manage them in case of an emergency. These phrases are used in announcements on the Public Address (PA) system.

Discuss the following question with your classmates.

Have you ever heard an announcement by a ship's public address system? If yes, what was the announcement about?

II. READING AND VOCABULARY

A Read the announcement and discuss what it is about.

ALL PASSENGERS!

Attention please. I will now give you the procedures that are to be followed in case of an emergency:

First of all, be aware that your life jackets are stored in your cabin. Please make sure that you have sufficient life jackets for the number of the guests sharing the cabin. If you do not, please contact to your state room steward. We ask you to read the emergency instructions notice located behind your cabin door. This notice will familiarise you with the ship's layout, the nearest escape routes, muster station locations and what to do prior to mustering. Assembly Station means muster station. In the event of a real emergency, a high-level lighting system will automatically be activated guiding you to the nearest exit. The muster stations are located as follows: Muster Stations A and B are on deck five port side, Muster Stations C and D are on deck five starboard side, Muster Stations E and F are on deck four and five in forward lounges. If your muster station is not accessible during an emergency, crew will guide you to an alternative location as directed by the captain. All children 12 years of age and under will be issued a wrist band that must be worn at all times. The crew members appointed to assist you can easily be identified by wearing their safety hats and vests. They will be standing along in the corridors, stairways and the muster stations. We remind you that smoking, drinking and using mobile phones are strictly forbidden, and all bars and food service will be closed for the duration of the safety briefing.

B Read the announcement again and say if the sentences are TRUE or FALSE.

1 This is an emergency announcement. ___
2 If you don't have enough life jackets you can ask for from your steward. ___
3 There are 3 muster stations on the starboard side of this ship. ___
4 All passengers have a wrist band on this ship. ___
5 Crew members who help the passengers can be recognised by their clothes. ___
6 You can have some refreshments in course of the safety briefing. ___

C Complete the collocations with the words from the text.

1 _____ routes
2 _____ band
3 _____ station
4 _____ briefing
5 _____ system
6 _____ instructions
7 _____ room

safety
emergency
muster
state
escape
wrist
lighting

D Read the text below and complete it with the given words in the box.

obey	emergency	instructions	regulations	secured	ready

Good afternoon ladies and gentlemen!

This is your Captain Yaşar Uzun speaking from the bridge. I have pleasure to inform you that all safety equipment is in full working order. The bow and stern doors are closed and _____ **(1)**. The vessel is in all respects _____ **(2)** for sea. Please listen carefully to the safety _____ **(3)** which follow. In the unlikely event of an _____ **(4)**, please _____ **(5)** the orders given on the public address system. Passengers are also requested to read all notes and leaflets in their cabins concerning safety _____ **(6)**. Thank you.

E Read the text below and match the highlighted words with their synonyms.

necessities = _____ essential =_____ guidance = _____

abandoning = _____ warning = _____ assembly = _____

Attention please. In about ten minutes time, there will be a safety **briefing** to all our guests and crew members who are appointed to assist and guide our guests during an emergency. This safety briefing is held in accordance with the **requirements** of the maritime laws, and all guests must participate. When the emergency **signal** sounds, you must proceed directly to your muster station. Your assigned **muster** station is printed on your sail and sign card, which is also your cabin door key. Please make sure you know how to get to your muster station. Our trained **evacuation** personnel will help you gather in your muster station if you need assistance. It is not **necessary** to bring your life jacket to the muster station for this briefing. Thank you for your participation.

III. WRITING

Write a short announcement about facilities on a passenger ship. Give brief information about their location, working times, and who can use them.

_____

_____

_____

_____

_____

_____

ABBREVIATIONS

Write the abbreviations in full forms:

1 **GPS:** _____

2 **PA:** _____

PROJECT Visit a ship and listen to the public announcements. Record the announcements and prepare a poster or a leaflet showing the content and warnings of the announcement. Present it to your class.

5C EXTERNAL COMMUNICATION

INTRODUCTION

I. LEAD IN Discuss the following questions with your classmates.

1 Do you know about VTS (Vessel Traffic Services) and its purpose?

2 What kind of information can be exchanged between VTS and a vessel?

II. READING AND VOCABULARY

External communication phrases are **applicable** phrases used in ship-to-shore, shore-to-ship and ship-to-ship communications when necessary. The purpose of a Vessel Traffic Service (VTS) is to provide active **monitoring** and navigational advice to vessels in **specified** busy ports or waterways. Typical VTS systems use radar, VHF (Very High Frequency) radiotelephony and automatic **identification** system to keep track of vessel movements. They provide simple information messages to ships about the **position** of other traffic or meteorological **hazards** warnings, identify incidents immediately in the specified maritime area and manage the traffic efficiently.



A VHF SET

A Match the highlighted words with their synonyms.

1 _____= dangers
2 _____= recognition
3 _____= location
4 _____= appropriate
5 _____= surveying
6 _____= designated

B Use the highlighted words to complete the sentences below.

1 The _____ number of a ship given by IMO is never reassigned to another ship.
2 The _____ of a vessel can be determined by GPS and send directly via DSC alert.
3 The _____ area will be searched and cleared of oil spillage.
4 There can be various_____ during navigation in bad weather conditions.
5 The _____ of ships is very important for managing marine traffic.
6 Some daily language cannot be _____to SMCP.

C Read the text and complete the collocations below.

1 very_____ frequency
2 _____ advice
3 _____ hazards warnings
4 specified _____ area
5 keep _____

III. WRITING AND SPEAKING

A Here is some information about a routine traffic operation exchange between VTS and a vessel. Match the information given from the vessel with the VTS recordings.

VESSEL'S INFORMATION	VTS RECORDINGS FOR TRAFFIC
1 WHEAT___	A VESSEL ARRIVAL TO PILOT STATION
2 MERSIN, TÜRKİYE _F_	B DESTINATION
3 ALEXANDRIA, EYGPT _K_	C SHIP'S FLAG
4 NONE ___	D TYPE OF CARGO
5 12.00 ___	E NUMBER OF CREW MEMBERS ON BOARD
6 CRYSTAL BLUE ___	F NEXT PORT OF CALL
7 721306000 ___	G AMOUNT OF CARGO
8 CANADA ___	H NUMBER OF PASSENGERS ON BOARD
9 X5OZ1___	I VESSEL'S NAME
10 10.000 metric tonnes ___	J MMSI NUMBER
11 LIVORNO, ITALY ___	K LAST PORT OF CALL
12 23 ___	L CALL SIGN

B Write the appropriate questions in these dialogues between the VTS and the vessel to acquire and provide routine traffic data. Complete the answers using table in Exercise A. Practice with a partner.

1 ***What is your vessel name and call sign?***
This is motor vessel _____call sign _____.

2 _____?
My MMSI number is _____.

3 _____?
My present position is 33° 55' N - 025° 51' E degrees, my speed is 15 knots.

4 _____?
My full manoeuvring speed is 20 knots.

5 _____?
My port of destination is _____.

6 _____?
My last port of call was _____ and next port of call is _____.

7 _____?
My ETA at pilot station is twelve hundred hours.

8 _____?
Pilot on board (POB) time is 1255 UTC.

9 _____?
Drop outward pilot (DOP) time is 1400 UTC.

10 _____?
My maximum draught is 8.7 metres.

11 _____?
My cargo is _____.

12 _____?
No, I don't carry any dangerous goods.

1 STANDARD PHRASES FOR VESSEL TRAFFIC SERVICE

I. LEAD IN When you are making a routine contact, you:

- address the responding ship or station
- give your name and call sign to identify yourself
- get confirmation of good reception from the responding ship or station.



Discuss the following question with your classmates.

Do you know how to start and end a conversation between a ship and VTS?

II. READING

Re-order the phrases below according to a standard VTS and ship message exchange.

_9_ **MV:** Sector Kavak. Standing by at channel one three. Out.
_1_ **MV**: Sector Kavak. This is Motor Vessel SEAGULL. Over.
___ **VTS:** SEAGULL. Thank you for your cooperation. Stand by at channel one three. Over.
___ **MV:** Sector Kavak. I will reduce speed to seven knots. Over.
___ **VTS:** SEAGULL. I read you poor. Switch to VHF channel one three. Over.
___ **VTS:** SEAGULL. Reduce speed to seven knots for transfer. Over.
___ **MV:** Sector Kavak. Switching to channel one three. Over.
___ **VTS:** Motor Vessel SEAGULL. This is Sector Kavak. Over.
___ **MV:** Sector Kavak. How do you read me? Over.

III. SPEAKING

A READIBILITY: How do you read me? I read you...

very good	barely perceptible	fairly good	weak	good

Phrase	with signal strength...	meaning:
bad/one	one	
poor/two	two	
fair/three	three	
good/four	four	
excellent/five	five	

B How do you say these using SMCP?

1 You receive the reception weak.→_____
2 Advise the recipient to change the channel.→ _____
3 You will change to the advised channel.→_____
4 You can receive the reception very good.→ _____

IV. VOCABULARY

MESSAGE MARKERS: When one of the SMCP does not fit the intended meaning or to make shore-to-ship and ship-to-shore communication clearer, one of the following eight **message markers** can be used. If a message marker is used, it precedes or follows the message.

A Match the message markers with their purposes.

MESSAGE MARKERS	THE INTENTION OF THE SENDER IS:
1 Instruction_____	a to indicate the message is a reply to a previous question
2 Advice_____	b to indicate the message is of interrogative character
3 Warning_____	c to indicate the message is restricted to observed facts, situations
4 Information_____	d to ask for an action for others about the vessel
5 Question_____	e to inform others about immediate navigational action
6 Answer_____	f to influence others by a regulation given by authorities (e.g., VTS)
7 Request_____	g to influence others by a recommendation
8 Intention_____	h to inform others about danger

B Write the correct message marker into the gaps.

Message	Message Marker
1 You are running into danger! Storm ahead.	
2 Yes, I require medical assistance.	
3 Advise you pass north of Pacific Star vessel.	
4 Berthing delayed for 2 hours.	
5 What is your cargo?	
6 Please supply bunkers.	
7 I will reduce speed to 20 knots.	
8 Proceed to berth number nine.	

C You see examples of Navigational Warnings from VTS. Study and complete the phrases with one word from the box.

operations rising vessel oceanographic reduced drifting ~~wreck~~ ~~survey~~ prohibited veering jettisoning ~~derelict~~ leakage laying slick

1 There is a dangerous ___*wreck*___ in position...
2 There is _____ mine reported in position...
3 There is a gas _____ in position...
4 There are pipe _____ operations in position...
5 There are salvage _____ in position...
6 M/V SEANUT is _____ cargo in position...
7 There are _____ instruments moored in position...
8 There is a ___*derelict*___ adrift in position...
9 There is a _____ of oil in position...and extending.
10 There is a _____ with a difficult tow on passage from 0900 to 1000 UTC.
11 The tide is _____. It is two hours before high water.
12 The wind is _____ and increasing.
13 Visibility is _____ by snow.
14 There is a vessel carrying out seismic ___*survey*___ in the area.
15 You are approaching a _____ fishing area.

5C EXTERNAL COMMUNICATION

V. WRITING AND SPEAKING

A This is a sample Preliminary Departure Report conversation between port control and a vessel. Complete the conversation with the phrases in the box. Practice the dialogue.

standing by channel one six and one one		**one point two metres by the stern**
two hundred hours at local time		**to starboard about one degree**
seven point five metres	**my destination**	**It is safe to navigate**

MV: Port Control. This is Motor Vessel GRANDE. Channel one one. Over.

PC: Motor Vessel GRANDE. This is Port Control. Go ahead. Over.

MV: Port Control. My ETD is _____ **(1)**. Over.

PC: GRANDE. What is your maximum deepest draught and what is your destination? Over.

MV: Port Control. My maximum deepest draught is _____ **(2)** and _____ **(3)** is Odessa. Over.

PC: GRANDE. Are you trimmed by the head or stern? Over.

MV: Port Control. I am trimmed_____ **(4)** Over.

PC: GRANDE. Do you have any list? Over.

MV: Port Control. I have a list _____. **(5)** Over.

PC: GRANDE. Is it safe to navigate? Over.

MV: Port Control. _____. **(6)** Over.

PC: GRANDE. Your message is understood. Stand by channel one six and one one. Over.

MV: Port Control. _____. **(7)** Out.

B Read the conversation and write the information in full form according to marine communication. Then practice with your partner.

MV: Port Control. This is Motor Vessel VAVIEN. How do you read me? Over.

PC: Motor Vessel VAVIEN. This is Port Control. I read you excellent. Over.

MV: Port Control. We passed Imbros Island on port side distance **1.5** _____ **(a)** miles. Over.

PC: VAVIEN. What is your present course and speed? Over.

MV: Port Control. My present course is **045** _____ **(b)** degrees and speed **10** _____ **(c)** knots. Over.

PC: VAVIEN. I have located on my radar. What is your full manoeuvring speed? Over.

MV: Port Control. My full manoeuvring speed is **7** _____ **(d)** knots. Over.

PC: VAVIEN. Your pilotage is compulsory. You must anchor at the anchorage area. Over.

MV: Port Control. What is my anchor position? Over.

PC: VAVIEN. Your anchor position is **39° 46' N - 025° 57.4' E** _____**(e).** Over.

MV: Port Control. My anchor position is 39° 46' N - 25° 57.4' E. Is that correct? Over.

PC: VAVIEN. That is correct. You must call when you drop at the anchorage area. Over.

MV: Port Control. I will call when I drop anchor at the anchorage area on channel 13. Over.

PC: VAVIEN. Follow me channel **16 and 13** ***one six and one three*** **(f)**. Over.

MV: Port Control. Stand by channel 16 and 13. Out.

2 DISTRESS, URGENCY AND SAFETY COMMUNICATIONS

I. LEAD IN

Digital selective calling (DSC) is a standard for transmitting pre-defined digital messages to all vessels in the range and the VTS or the Port Service via medium-frequency (MF), high-frequency (HF) and very-high-frequency (VHF) maritime radio systems.

Discuss the following questions with your classmates.

1 What kind of problems can occur on board during shipping operations?

2 Do you think it is important to report these problems to other ships and VTS? Why?

II. READING

Study the chart about DISTRESS, SAFETY and URGENCY messages.

MESSAGE	SIGNAL	WHAT TO DO?
DISTRESS	MAYDAY	After the transmission of a DSC Distress/Urgency/Safety alert, switch the transmitter to VHF Channel 16 and transmit the Distress/Urgency/Safety message. Repeat the signal three times.
URGENCY	PAN PAN	
SAFETY	SÉCURITÉ	

A1 Match the message types (URGENCY/SAFETY/DISTRESS) and signals (MAYDAY/ PANPAN/ SÉCURITÉ) with the messages:

A	B	C
1_____ ALL SHIPS ALL SHIPS ALL SHIPS IN SUEZ CANAL THIS IS SIX-TWO-TWO-THREE-ONE-NINE-ONE-ZERO-ZERO __ MOTOR VESSEL UNIVERSE CALL SIGN ECHO-JULIET-ZULU __ THERE IS A DRIFTING MINE REPORTED IN POSITION THREE ZERO DEGREES THREE FIVE MINUTES NORTH ZERO THREE TWO DEGREES ONE SIX MINUTES EAST OF SUEZ CANAL OVER	2_____ __ THIS IS SIX-TWO-TWO-THREE-ONE-NINE-ONE-ZERO-ZERO MOTOR VESSEL UNIVERSE _ CALL SIGN ECHO-JULIET-ZULU __ POSITION THREE FIVE DEGREES FIVE NINE MINUTES NORTH ZERO ZERO FIVE DEGREES TWO NINE MINUTES WEST I AM ON FIRE AFTER EXPLOSION I REQUIRE FIRE FIGHTING ASSISTANCE SMOKE IS NOT TOXIC OVER	3_____ __ ALL STATIONS ALL STATIONS ALL STATIONS THIS IS SIX-TWO-TWO-THREE-ONE-NINE-ONE-ZERO-ZERO MOTOR VESSEL UNIVERSE CALL SIGN ECHO-JULIET-ZULU POSITION THREE FIVE DEGREES FIVE NINE MINUTES NORTH FIVE DEGREES TWO NINE MINUTES WEST __ I HAVE PROBLEM WITH PROPELLERS __ I REQUIRE TUG ASSISTANCE

A2 Match the given information with the phrases in the message. Write the correct items in boxes in Exercise A1.

a The name of the vessel
b The position of the danger
c The assistance required
d The urgency on board
e The 9-digit MMSI number
f The position of the vessel
g The recipient of the message

III. VOCABULARY

A Match the terms used in maritime communication with their definitions.

TERMS	MEANINGS:
1 aground____	a death in an accident or shipping disaster
2 capsized____	b the passage of a vessel through a canal, fairway etc.
3 wreck____	c an object such as a wreck or net that blocks a fairway, route etc.
4 convoy____	d turning of a vessel upside down in water
5 obstruction____	e a navigable deep-water channel in a river, harbour or along a coastline
6 derelict____	f a destroyed, abandoned or sunk vessel at sea
7 casualty____	g touching the ground below the water
8 adrift____	h a group of vessels which sail together through a canal or ice etc.
9 transit____	i goods or commodity abandoned at sea by a vessel
10 fairway____	j floating without control; not under command

B Complete the sentences with the terms given in Exercise A.

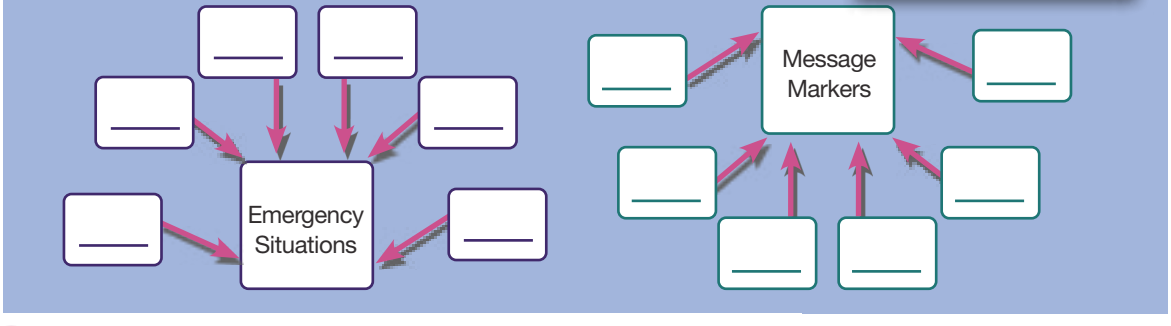
1 You are approaching radar reference line of _____.
2 Your station in _____ will be number 5.
3 _____will begin at three hundred hours.
4 Shallow water ahead of you. You are running _____.
5 There are no _____but three injured crew after the explosion.
6 All crew must abandon vessel before its _____.
7 Submerged _____ is reported ahead of you. Navigate with caution.
8 Dangerous _____ reported at 15° north-west of you.
9 The crew spent a day _____ on the ship due to heavy storm.
10 There is dangerous _____ drifting ahead of you.

C Match the two halves to make collocations.

1 floating ___	a substance
2 tug ___	b position
3 noxious ___	c ice
4 present ___	d assistance
5 navigational ___	e lights

D Put the words on the right into the correct categories.

warning
not under command
capsized
request
adrift
wreck
advice
disabled
intention
instruction
derelict
information



IV. WRITING

A Complete the message with the words in the box.

anchorage	visibility	information	navigational	closed	fairway

Attention all vessels. This is port control. _____ **(1)** warning. Follow us on channel one two. Navigation in the fairway is now _____ **(2)** due to dense fog. _____ **(3)** in the fairway decreased to less than two hundred metres. All vessels navigating in the _____ **(4)** must go to emergency _____ **(5)**. All vessels keep channel one six and one two for further _____ **(6)**. This is port control. Out.

B Write a similar warning message from Port Control. Use the given information.

Channel : One seven
Warning : Many small fishing boats in operation in Marmara Sea
Instruction : Navigate with caution
Proceed at slow speed
Stand by channel one seven

_____
_____
_____
_____
_____
_____

ABBREVIATIONS

Write the abbreviations in full forms:

1 **POB:** _____
2 **DOP:** _____
3 **VTS:** _____
4 **VHF:** _____
5 **MF:** _____
6 **DSC:** _____

PROJECT Work in groups and prepare an emergency scene on board. Write on board and external communication dialogues about the emergency using SMCP. Then act out with your groupmates.

SELF ASSESSMENT 5	1	2	3
1 I can dictate and note ship's call signs/messages using SMCP basics.			
2 I can read and interpret some terms and phrases used in SMCP.			
3 I can interpret Distress/Urgency/Safety messages from other ships.			
4 I can send Distress/Urgency/Safety messages to other ships.			
5 I can answer Distress/Urgency/Safety messages from other ships.			
6 I can make on board communications using SMCP.			
7 I can make external communications using SMCP.			

REVISION 5

A Check what you've learned. Complete the sentences with the given words.

convoy	sixteen	read	transfer	comply with	leaking
to identify	assistance	listing	MMSI	jettisoning	distress

1 SMCP _____ STCW, SOLAS Conventions and international regulations.
2 _____ speed is the permitted speed of a vessel for navigating safely through a fairway or a canal.
3 _____ is the leaning of a vessel onto its port or starboard side because of uneven load or weight.
4 A group of vessels passing through a passage or fairway at scheduled times is called _____.
5 In case of a need, a vessel asks for a tug, medical, navigational _____ etc.
6 The nine-digit number to identify a vessel is the _____ number.
7 _____ is a vessel's dumping some cargo to refloat in case of grounding.
8 You say your MMSI number and call sign _____ yourself.
9 "How do you _____ me?" is used to ask how well the other party receives you.
10 The phrase MAYDAY is repeated three times when starting a _____ call.
11 If a vessel is _____ inflammable cargo you must keep clear of her.
12 The international designated distress call VHF is channel _____.

B Look at the group of words and circle the odd one out.

1	distress	emergency	safety	urgency
2	sinking	capsizing	spilling	escorting
3	Zulu	Alfa	White	Juliet
4	intention	information	advice	comment
5	UTC	NAVTEX	VHF	DSC
6	pipe laying	oil clearance	salvage	pilotage
7	proceed	navigate	stop	steer
8	obstruction	vessel	derelict	wreck
9	route	fairway	canal	passage
10	course	route	position	anchorage



6 SEAMANSHIP

In this unit, you will...

- talk about routine maintenance work and basic maintenance equipment on board
- get familiar with manoeuvring equipment and orders
- tell what you can see on a navigational chart
- tell the names and scope of basic nautical publications
- talk about general meteorological terms and weather forecast
- recognise weather instruments and tell what they are used to measure
- get familiar with pressure systems
- get familiar with weather reports and deck log book entries about meteorology

6A MAINTENANCE AND MANOEUVRING OPERATIONS

INTRODUCTION

I. LEAD IN Discuss the answers to the questions with your classmates. Share your views.

1 What does the term "seamanship" refer to you?

2 What kind of knowledge and skills do you think you will need for seamanship?

3 Describe the photos below. Where are the people? What are they doing?





II. READING

A Read the text about seamanship and complete the missing parts with the given pieces of sentences.

knowledge and competence	**depending on the ranks**	**operating a vessel**
safety and emergency	**cargo handling**	**can take initiatives**
training crew members	~~**maritime rules**~~	

Seamanship can broadly be defined as the capability of _____ **(1)** according to international standards and ***maritime rules*** **(2)**. It requires _____ **(3)** in various fields such as navigation, marine communications, weather forecast, meteorology, _____ **(4)**; and several operations including watchkeeping, manoeuvring, mooring, maintenance, _____ **(5)** etc. The knowledge and competence in these fields naturally vary_____ **(6)**, qualifications, experience and skills of seafarers; nevertheless, we should not get seamanship in terms of individual crew members, but as a whole. For a good seamanship, experienced and qualified seafarers who_____ **(7)** when necessary and who can act quickly and correctly in emergencies are important. _____ **(8)** well and supervising the work frequently are also essential.

B Read the text again and answer the questions.

1 What is seamanship?

2 What qualifications are necessary for seamanship?

3 What kind of work does seamanship include?

III. VOCABULARY

A Match the halves to form meaningful phrases.

1 Weather ___	a initiative
2 Operate ___	b moving parts
3 Take ___	c a position
4 Lubricate ___	d a vessel
5 Plot ___	e forecast

B Fill in the gaps with the phrases in Exercise A.

1 _____ is frequently checked and reported during navigation since it is essential for a safe voyage.
2 Officers are working on a nautical chart to _____.
3 During maintenance, a special kind of oil is used to _____.
4 If you want to be a manager, you must learn how to _____ in unexpected situations.
5 You need to gain a lot of qualifications and experiences in order to _____.

IV. SPEAKING AND WRITING

A1 Work in groups and discuss what people are doing in the photos in Exercise A2 below.

e.g., *In photo 1, we see a crew member holding a pen and a chart divider in his hands. He is working on a chart.*

A2 Write the operations under the correct photos as in the example.

docking	mooring	repairing a ladder
lubricating moving parts		~~plotting a position on a chart~~



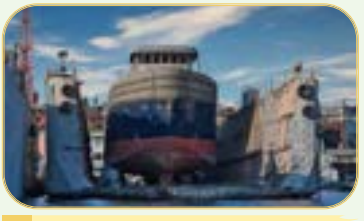
1 plotting a position on a chart



2



3



4



5

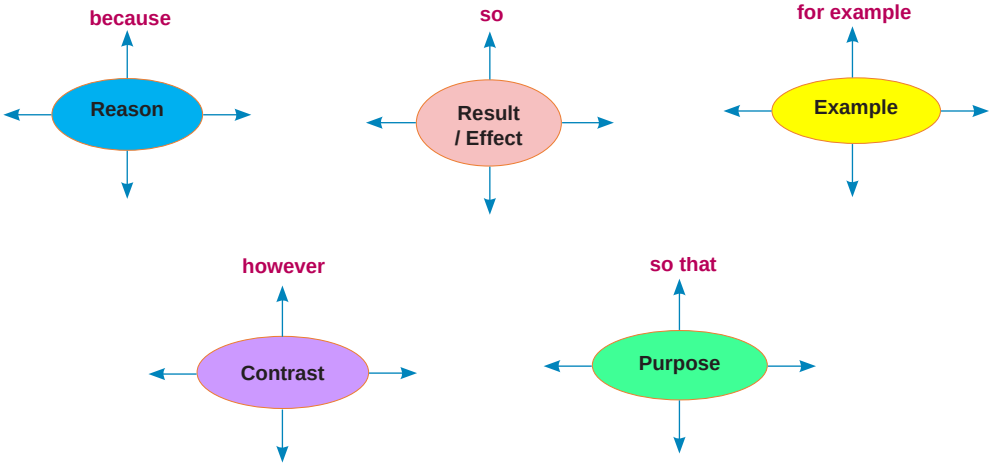
6A MAINTENANCE AND MANOEUVRING OPERATIONS

V. LEARN THIS

Some words are used to connect two sentences in terms of contrast, cause/reason, effect/ result, purposes, exemplifying, giving additional information etc. Some linking words are in the box below:

for example	*in order to*	*due to*	*thus*	*that's why*
however	*therefore*	*nevertheless*	*although*	*for instance*
such as	*despite*	*so that*	*in order that*	*so*
because	*since*	*to*	*like*	*for*

A Work in pairs and write the linking words from the table to complete the spider grams.



B Match the halves and connect the clauses choosing a linking word from Exercise A. Then, write the sentences in full.

1 You have to use PPE
2 Cadets should observe the officers very carefully
3 The weather was not very cold
4 We are going to work on a ship soon
5 Maintenance consists of a number of operations

___ **a** painting, scraping, lubricating moving parts.
___ **b** the wind made us feel it colder than it was.
___ **c** we are having the required training now.
___ **d** protect yourself from the accidents.
___ **e** they are going to be officers in the future.

1 _____
2 _____
3 _____
4 _____
5 _____

1 MAINTENANCE

I. LEAD IN Discuss the answers to the following questions. Share your views.

1 What do you think the purpose of maintaining a vessel is?

2 What kind of operations can maintenance involve?

II. READING

A Read the text and match the paragraphs with the topics in the box with your partner.

A Types of planned maintenance _____

B The aim of planned maintenance _____

C Who oversees maintenance _____

D The situations that unplanned maintenance takes place _____

E Where maintenance takes place _____

F Critical issues to be considered when planning the maintenance _____

G What are considered when determining the maintenance plan of a component _____

H The reasons of carrying out maintenance _____

I Testing methods used to determine an item's maintenance needs ____

J Examples of maintenance work on board ____

K Types of docking ____

MAINTENANCE OF A VESSEL

1 Maintenance of a vessel includes a series of operations carried out to preserve good condition of the shell plating and the hull, and proper function of its machinery and equipment. Testing various machinery and equipment; sounding tanks; measuring the values such as temperature and pressure; checking **watertightness** of doors, hatch covers and leak tightness of tanks; cleaning, scraping, and painting operations; lubricating moving machinery parts; repairing breakdowns and replacing **worn out** parts; correcting and updating charts are among maintenance works on a vessel.

2 Maintenance can be planned or unplanned. Planned maintenance is carried out in a system called Planned Maintenance System (PMS). PMS includes maintenance of shell plating and hull surfaces, equipment, and machinery at certain **intervals** (e.g., weekly, monthly, quarterly, biannually, annually, or in longer periods). Maintenance of an item is predetermined according to manufacturer's instructions, running hours, or operating time. Some planned maintenance work is among routine duties of the crew and can be applied on board; others are carried out at the **dockyard**. During docking process, the vessel is taken into a dock, usually a dry dock, and its contact with water is cut. Sometimes a floating dock can be used for planned maintenance. In this type of docking, the dock, itself is on water, and it has rooms that the vessels are floated in; and then the water is drained to provide a dry area.

3 PMS can be preventive, or predictive. Within preventive maintenance, specific items are inspected on a regular basis, in certain intervals to prevent a failure. The intervals are determined according to manufacturer's instructions or running hours. Predictive maintenance consists of routine measurement and monitoring of items in order to detect any **defects** that might result in a failure at an early stage. During predictive maintenance, engineers might use monitoring devices, sensors, or their own senses to assess the warnings that the machinery gives like a leakage, a **slack**, an unusual noise, a vibration, or a change in the temperature.

6A MAINTENANCE AND MANOEUVRING OPERATIONS



4 The main purpose of PMS is to preserve **seaworthiness** of the vessel, and to reduce the time and the cost of repairs. PMS must be carried out in accordance with class and flag state requirements, company's policies, international standards, and regulations. Eliminating marine pollution risk, safety of the passengers, the crew, and the cargo are also critical concerns in the maintenance plan; so, the maintenance of critical equipment such as alarm systems, machinery systems, life-saving, fire-fighting, and PPE is prioritised.

5 The C/E and the C/O are responsible for shipboard maintenance; and the 2/E is usually charged to plan the maintenance of a vessel.

6 Unplanned maintenance can also emerge at times, when a component, a piece of machinery or equipment has a failure. Breakdown maintenance is carried out to repair or replace the item as soon as possible. Details of breakdowns, and applied maintenance is usually recorded in the **log book**.

B Read the text again and choose the best item.

1 Maintenance can be carried out _____.

- A both on board and in the dockyard
- B in the dockyard in certain intervals
- C on board when there is a breakdown
- D in the dockyard when there is a failure of a component

2 A series of examinations is conducted within _____.

- A preventive maintenance
- B breakdown maintenance
- C predictive maintenance
- D unplanned maintenance

3 The failure of a component or equipment leads to _____.

- A preventive maintenance
- B predictive maintenance
- C planned maintenance
- D breakdown maintenance

4 _____ is the routine maintenance of certain items in predetermined intervals.

- A Preventive maintenance
- B Predictive maintenance
- C Unplanned maintenance
- D Breakdown maintenance

5 _____ is not a maintenance work.

- A Painting the accommodation
- B Cooking the meals
- C Lubricating the machinery parts
- D Cleaning the deck

III. VOCABULARY

A Complete the sentences with the highlighted words from the text on Page 171 and 172.

1 Navigational and meteorological data is usually recorded in the _____.
2 Vessels are built or maintained in the _____.
3 His house is very old, and all his furniture is _____.
4 Everyone should have check-ups at certain _____ so that the diseases can be diagnosed at an early stage.
5 If minor _____ are not corrected at once, they might cause a major breakdown.
6 Pull in the _____ of the ropes! They should be tight.
7 International standards are referred to determine the _____ of a ship.
8 _____ of the containers have been checked before loading the cargo.

B Match the words for maintenance work with their definitions in maritime terminology.

1	bunkering	coating and colouring a surface with paint
2	mooring	applying oil on a mechanical part of a machinery to ease its movement
3	scraping	measuring the depth of liquids by a special device
4	painting	securing a vessel by fastening it to somewhere via ropes, cables etc.
5	lubricating	removing the rust from a metal surface rubbing harshly via a scraping tool
6	sounding	removing heavy rust from the metal surface by a hammer or a chisel
7	chipping	taking fuel into a vessel's oil tank

C Circle the correct form of the verbs in bold.

1 Experts **recommend/recommendation** sleeping before 11 at night.
2 It is not always easy to **predict/predictive** what is he going to do next. He is unpredictable.
3 Always wear your **protection/protective** equipment when working in hazardous spaces.
4 You must stay calm and act quickly when unexpected situations **emerge/emergency**.
5 If you notice a **fail/failure** in a machinery, report to the engineer immediately.
6 Routine checks and **maintain/maintenance** work must be applied properly.
7 We can **detect/detection** some breakdowns in our car by listening to the voice of the motor.
8 Unless you bear the costs of **prevent/preventive** actions, you will have a bigger financial loss in case of an accident.

D Match the names of maintenance equipment with the photos.

1 Wrench___
2 Wire brush___
3 Chipping hammer___
4 Angle grinder___
5 Grease gun___
6 Jet Chisel___
7 Scraper___
8 Paint brush___
9 Roller brush___
10 Paint___

A



B



C



D



E



F



G



H



I



J



IV. SPEAKING AND WRITING

A Describe the photos of maintenance operations. Give details like where the people are, what they are wearing, what they are doing, what kind of equipment they are using etc.

e.g., *In **Photo A**, we see a crew member who is wearing orange overalls and a white helmet. He is painting the floors on the deck using a roller brush.*

A 

B 

C 

D 

E 

F 

G 

H 

I 

J 

K 

L 

6A MAINTENANCE AND MANOEUVRING OPERATIONS

B **Complete the sentences with the verbs in the box, and then match them with the photos in Exercise A on Page 175.**

lubricate	**scrape**	**record**	**update**	**paint**	**check**
measure	**maintain**	**repair**	~~**clean**~~	**float**	**chip**

C 1 Two deck ratings *are cleaning* a cargo hold using pressurised water.

_____ 2 An O/S _____the rust on the outboard by a jet chisel.

_____ 3 A deck officer _____ data in the deck log book.

_____ 4 They _____ a ship into the dry dock.

_____ 5 An A/B _____ deck areas using a roller brush.

_____ 6 A deck rating _____ a mooring equipment using a grease gun.

_____ 7 The navigation officer _____ the nautical chart.

_____ 8 An engineer _____ a machine with two wrenches in his hand.

_____ 9 Workers _____ a vessel in the dockyard.

_____ 10 A young engineer _____ the engine parameters in the engine room.

_____ 11 The ETO _____ the voltage of an electric line.

_____ 12 A crew member _____ the deck floors using an angle grinder.

C1 A vessel's outboard or other metal surfaces corrode in time due to humidity, changes in temperature, salty water, and waves. A series of maintenance operations are carried out to protect metal surfaces from corrosion such as **chipping**, **scraping**, **washing**, and **repainting**.

Re-order the sentences in the correct sequence of operations to prevent corrosion.

___ Wash the surface to remove the residue of salt, oil or dirt.

___ Coat the surface repainting it.

1 Remove the heavy rust and the scales of old paint.

___ Remove the remaining rust on the bare metal.



C2 **Match the operations in Exercise C1 with the equipment and materials below.**

a a wire brush_____

b fresh water _____

c a chipping hammer or a chisel _____

d metal primer, base coating, and top coating paints and brushes _____

V. LEARN THIS

We add **prefixes** to the beginning of a word and form a new word with a different meaning. Most commonly used prefixes are "**co-**, **pre-**, **post-**, **up-**, **over-**, **mis-**, **under-**, **re-**, **sub-**, **extra-**, **inter-**, **out-**, **anti-**", and negative making prefixes such as "**un-**, **in-**, **il-**, **ir-**, **im-**, **dis-**".

e.g., *recycle, cooperate, subtitle, international, submarine*

Complete the sentences by adding a prefix from the box to the words in parenthesis.

over	**up**	**mis**	**pre**	**un**
multi	**extra**	**counter**	**dis**	**under**

1 **(DETERMINE)** We must _____ the maintenance plan; otherwise, we'll skip something important.

2 **(DATE)** There will be an_____ in our application soon. Follow us carefully.

3 **(PLANNED)** We'll have to delay our meeting because of an _____ drawback.

4 **(APPEARED)** I saw something in the backyard, but it has _____ immediately.

5 **(UNDERSTOOD)** You _____ me. I said you are skilful for the job, but you'll need further training.

6 **(ESTIMATE)** Don't _____ the risks of working in the engine room. Wear related PPE all the time.

7 **(SEE)** Officers and/or engineers _____ the maintenance period and they check the work frequently.

8 **(CULTURAL)** Most vessels navigate in international waters and the crew is usually _____; so, crew members should speak English very well and know international ethics and polite manners.

9 **(ORDINARY)** This region is normally quite dry during summer. Having thunderstorms here in this season is quite _____.

10 **(CLOCKWISE)** I am afraid you are doing it wrongly. You must turn the valve _____ if you want to open it.

2 MANOEUVRING

I. LEAD IN Discuss following questions in class. Share your views with your classmates.

1 What do you think manoeuvring is?
2 What kind of orders do you think manoeuvring orders are? Who gives the orders?

II. READING

A Read the text and match the topics with the numbered sentences.

MANOEUVRING

[1]Manoeuvring is the action of changing the direction and/or position of a vessel from its **steady course**. [2]The vessel is manoeuvred when passing through narrow canals; when entering or leaving ports; during anchoring and mooring operations; when the vessel **encounters** an **obstruction** (e.g., an iceberg, an uncharted island) in/around traffic zones and shallow waters; and in bad weather conditions. While passing through canals, or during **berthing** and unberthing operations, a pilot assistance and/or tugboat escort are usually provided but getting assistance may not be always possible during manoeuvring operations.
[3]Seamanship skills are very important for manoeuvring because it involves various risks and requires additional actions. [4]Depth of water, wind, tide and current states, and the recent condition of the manoeuvring areas must be taken into account. Throughout manoeuvring and berthing operations, a series of orders or instructions are given by the master or the officer of watch (OOW). These orders are completely **fulfilled** by the operators. [5]Manoeuvring orders are standardised, **intelligible** orders which OOW gives to the operators. [6]Standard manoeuvring orders are wheel orders, engine orders, mooring and anchoring instructions.

A Things that must be considered before starting manoeuvring ____
B Types of manoeuvring orders____
C The definition of manoeuvring____
D When a vessel is manoeuvred____
E The reasons why further seamanship skills are needed in manoeuvring ____
F The definition of manoeuvring orders _____

B Read the text again and write TRUE/FALSE for the sentences below.

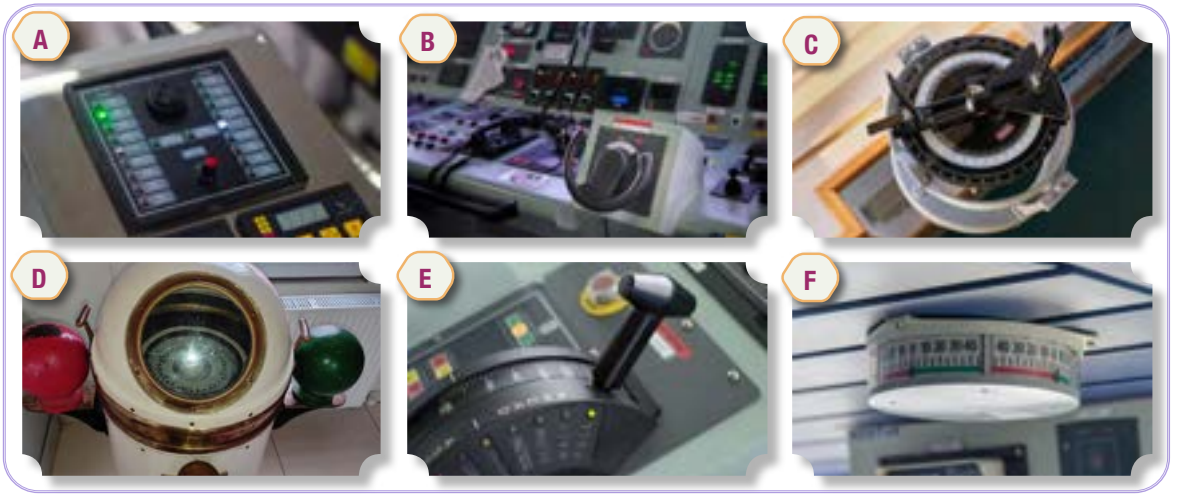
1 Vessels are manoeuvred when coming close to the mooring areas. _____
2 Weather conditions are not considered when planning manoeuvring. _____
3 Manoeuvring orders are given by deck cadets to the master of the vessel. _____
4 Vessels are normally accompanied by tugboats while passing through canals. _____

III. VOCABULARY

A Find the highlighted words or phrases in the text with the closest meaning to the following words and phrases.

1 Understandable _____
2 Carried out _____
3 Fixed route _____
4 Anchorage _____
5 Comes across _____
6 Block _____

B Study the photos of engine telegraphs and steering equipment and complete the sentences.



1 In photo ____, I can see a gyro compass.
2 In photo ____, I can see a magnetic compass.
3 In photo ____, I can see a steering indicator.
4 In photo ____, I can see lever-type engine telegraph.
5 In photo *B*, I can see a helm.
6 In photo ____, I can see a pushbutton engine telegraph.

C Work in pairs. Reorder the letters and write the names of mooring equipment.



o-l-l-b-a-r-d _____ 1



a-s-l-i-w-n-d-s _____ 2



o-c-k-c-h _____ 3



a-a-n-p-a-m e-a-l-d
_____ _____ 4



c-a-e-t-l _____ 5

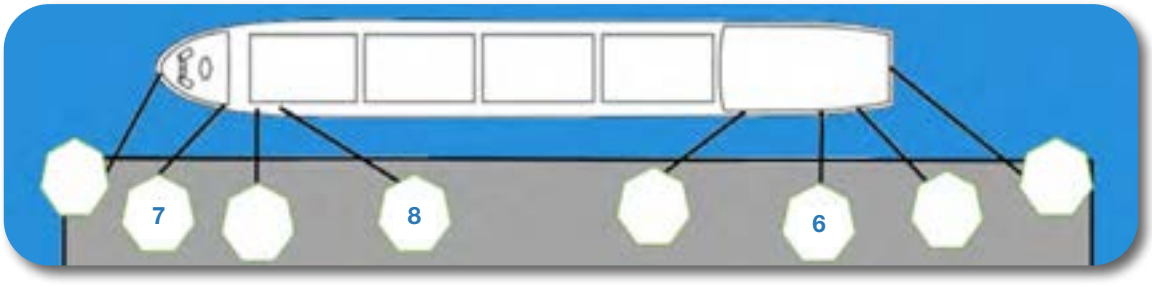


a-i-r-f-a-l-e-d _____ 6

6A MAINTENANCE AND MANOEUVRING OPERATIONS

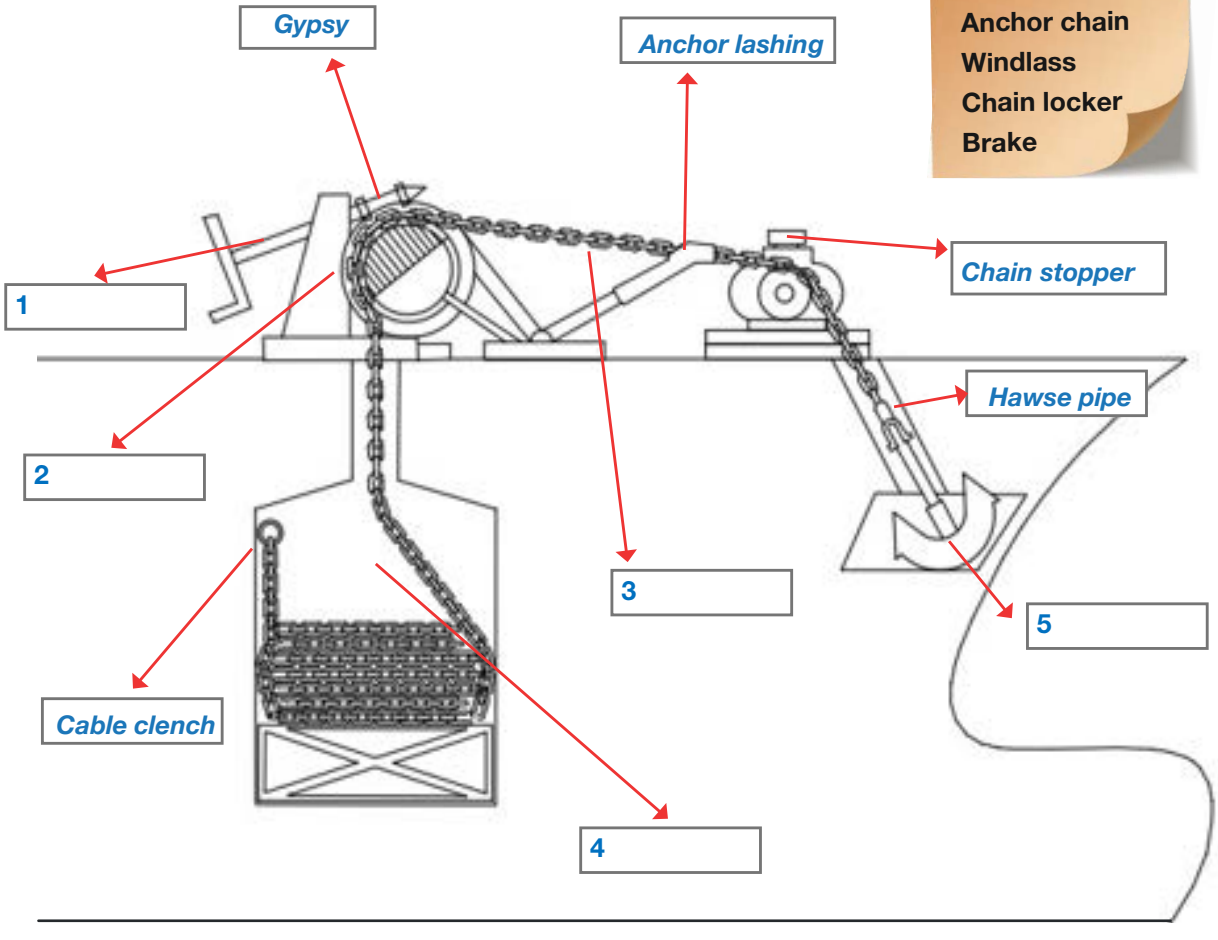
D Look at the diagram and write the missing numbers of the mooring lines on the picture.

1 fore breast line	2 quarter line	3 stern line	4 aft spring
5 head line	6 ~~aft breast line~~	7 ~~bow line~~	8 ~~fore spring~~



E Look at the diagram showing the mooring gear on a vessel and write the missing parts from the box.

Anchor
Anchor chain
Windlass
Chain locker
Brake



IV. WRITING AND SPEAKING

A Complete the table with the wheel orders in the box on the right.

WHEEL ORDER	MEANING
Port five	5° of port rudder to be held
1_____	Rudder to be held fully over to port
Steady	Reduce swing as rapidly as possible
2_____	10° of starboard rudder to be held
Ease to five	Reduce amount of rudder to 5° and hold
3_____	Rudder to be held in the forward and after position
4_____	Avoid allowing the vessel's head to go to port
Meet her	Check the swing of the vessel's head in a turn
5_____	Reduce amount of rudder to 20° and hold
Nothing to starboard	Avoid allowing the vessel's head to go to starboard
Hard-a-starboard	Rudder to be held fully over to starboard
6_____	Steer a steady course on the compass heading indicated time of the order

Starboard ten
Ease to twenty
Nothing to port
Steady as she goes
Hard-a-port
Midships

B Read the information and write the wheel orders in the missing parts, and then practice the dialogue in pairs. Repeat the dialogue swapping the roles and changing the orders.

- The helmsman should repeat the order after hearing it, and s/he should report after fulfilling the order.
- The degrees on the compass should be read separately e.g., for 107°, you say one zero seven degrees.

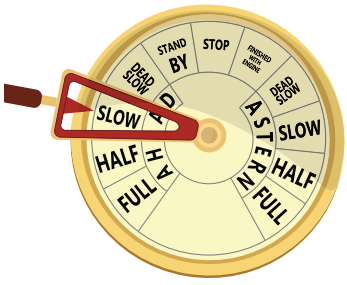
The Master: What is your heading?
The Helmsman: My heading is zero eight seven degrees.
The Master: _____ **(1)**
The Helmsman: Starboard ten … Starboard ten now.
The Master: _____ **(2)**
The Helmsman: Midships … Midships one zero five degrees now.
The Master: _____ **(3)**
The Helmsman: Steady one zero five degrees … Steady on one zero five degrees now.

C Read the engine orders and write the items to match them with the required actions to be operated.

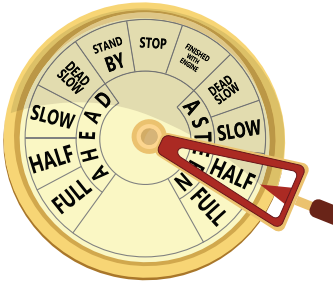
ENGINE ORDERS	What is required?
1 **Full ahead/astern**_____	a To move forward/rearward slowly.
2 **Half ahead/astern**_____	b Not to keep engines operating anymore.
3 **Slow ahead/astern**_____	c To stop the engines.
4 **Dead slow ahead/astern**_____	d To move forward/rearward in half power.
5 **Finished with engines**_____	e To get ready to manoeuvre.
6 **Stop engines**_____	f To move forward/rearward in full power.
7 **Stand by engine**_____	g To move forward/rearward very slowly.

6A MAINTENANCE AND MANOEUVRING OPERATIONS

D Write the engine orders under each engine telegraph.



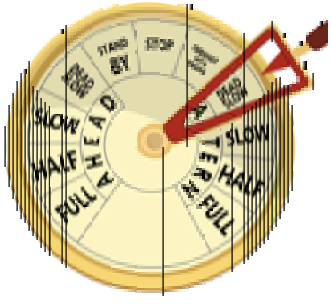
1 *Slow ahead*



2



3



4



5

E Write the definitions of the anchoring and mooring terms in the correct line on the table.

1 Keep up the line in its current situation
2 Let go all other lines except for one
3 Strain and tighten
4 Be ready and wait for the action
5 Prepare the windlass for operation
6 Drop the anchor(s)
7 Release the cable(s)
8 Lift the anchor(s) up to the vessel
9 Fasten/Tie up
10 Loosen the line

Anchoring and Mooring Terms	Meaning
A Stand by for … (e.g. letting go the port/starboard anchor or both).	
B Let go the port/starboard anchor or both anchors.	
C Heave up the port/starboard anchor or both anchors.	
D Slack out the cable(s).	
E Slack away the (e.g. quarter, stern) line.	
F Make fast.	
G Put the windlass in gear.	
H Single up the (e.g. breast, spring) line(s).	
I Pick up on the slack (e.g. spring, breast) line(s).	
J Hold on the (e.g., breast, spring) line(s).	

F Complete the dialogue using the terms and expressions in the box. Then, practice it in pairs.

The Master: Chief, we will let go the port anchor. Put three shackles in the water.
The Chief Officer: Copy that, sir.
The Master: _____ **(1)**.
The Chief Officer: The windlass in gear now.
The Master: Stand by for letting go the port anchor.
The Chief Officer: _____ **(2)** the port anchor.
The Master: _____ **(3)**.
The Chief Officer: Letting go the port anchor.
The Chief Officer: Third shackle is in the water, sir.
The Master: Alright. _____ **(4)**.
The Chief Officer: Holding on the cable, sir.
The Master: How is the cable growing?
The Chief Officer: The cable is growing tight.
The Master: Alright. Slack out the cable about one more shackle.
The Chief Officer: _____ **(5)** one more shackle.
The Master: Is the anchor holding?
The Chief Officer: Yes, _____ **(6)**.
The Master: All clear. Finish with the manoeuvring station.

- Let go the port anchor
- Slacking out the cable
- the anchor is holding
- Put the windlass in gear
- Standing by for letting go
- Hold on the cable

V. LEARN THIS

We use different prepositions to give details about an event or a state or to form a collocation.

Work with your partner and complete the sentences with the correct prepositions in the box.

within	among	into	through	by	throughout

1 The ship is now passing _____ the Suez Canal.
2 The containers have been loaded _____ port cranes on the container ship.
3 The weather was favourable, and the wind was light _____ the voyage.
4 The navigation officers have to prepare a flexible voyage plan taking unexpected incidents _____ account.
5 Variety of fixing, painting, and measuring operations are included _____ the maintenance plan of a vessel.
6 Suez, Panama, Kiel and Volga-Don are _____ the main canals used for interocean passages during navigation.

PROJECT In groups, visit a dockyard and observe the maintenance work carried out. Take notes, take photos, video-record and talk to people there. Prepare a presentation telling your experience and observations.

6B NAUTICAL CHARTS AND PUBLICATIONS

INTRODUCTION

I. LEAD IN Discuss the answers to the questions with your classmates.

1 What do you think nautical charts are used for in navigation?

2 Do you know any nautical publications? What are they?

II. READING AND WRITING

Read the answers and complete the questions.

NAUTICAL CHARTS

1 What _____?

- Nautical charts are graphic representations of navigable waters and some parts of coastal areas.

2 Why _____?

- Nautical charts are among the essential tools in navigation; therefore, navigation officers must know how to read and use them.

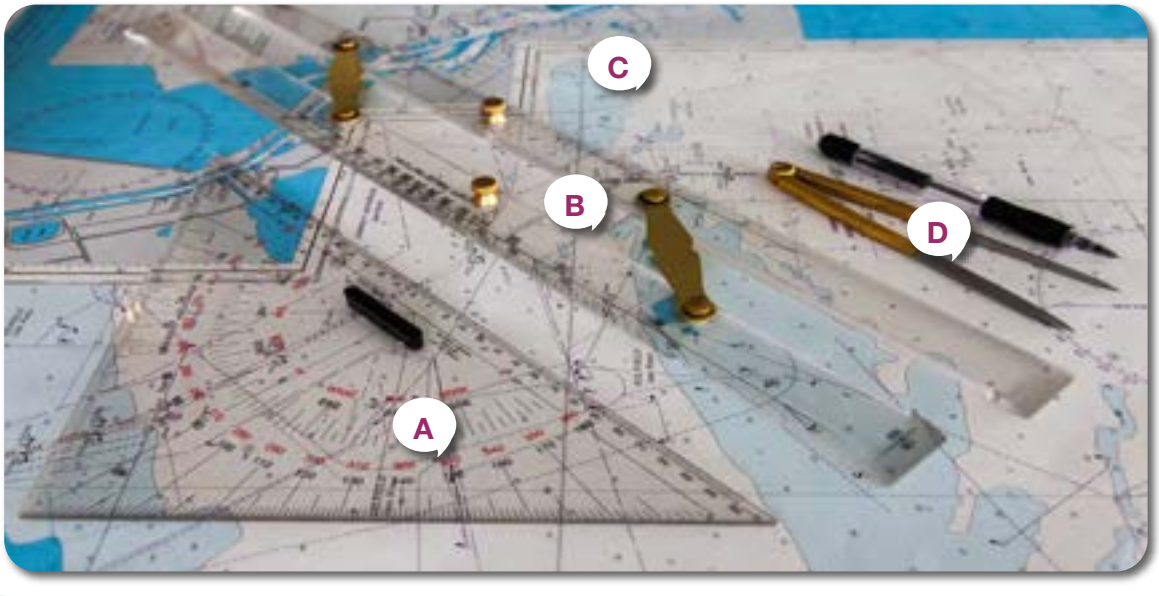
3 What kind of _____?

- Nautical charts can provide information on depth of the water, features of the seabed, currents, tides, aids to navigation, harbours, canals, and landmarks depending on their scale.

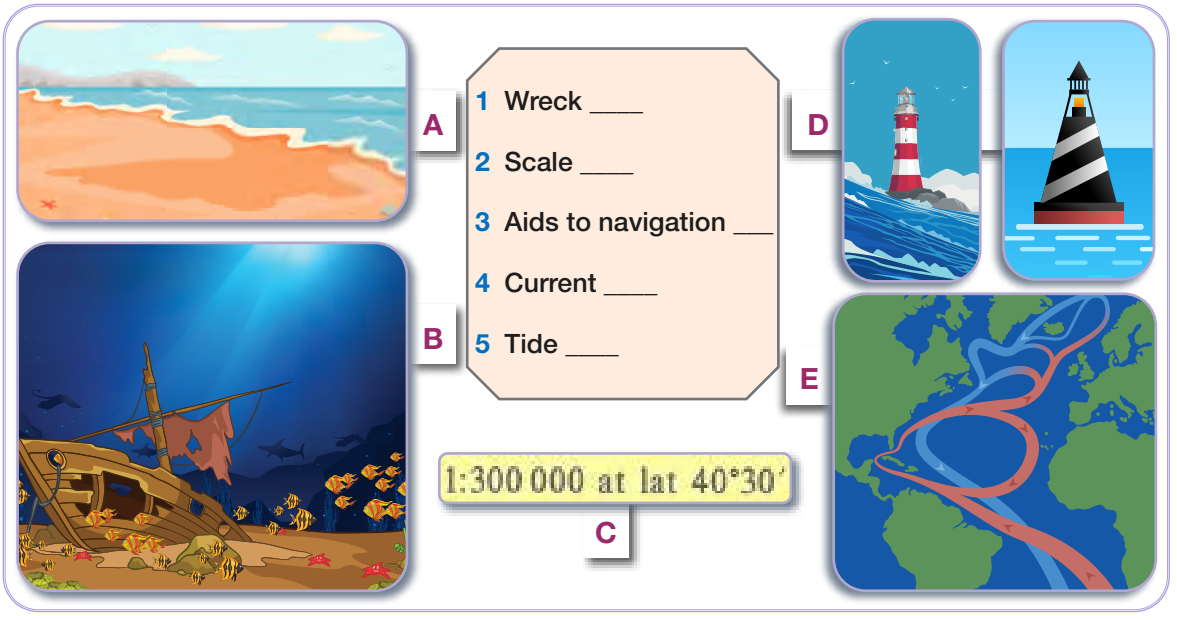
III. VOCABULARY

A Match the chart work equipment with the items on the photograph.

1 a nautical chart __ 2 a nautical triangle __ 3 a parallel ruler __ 4 a chart divider __

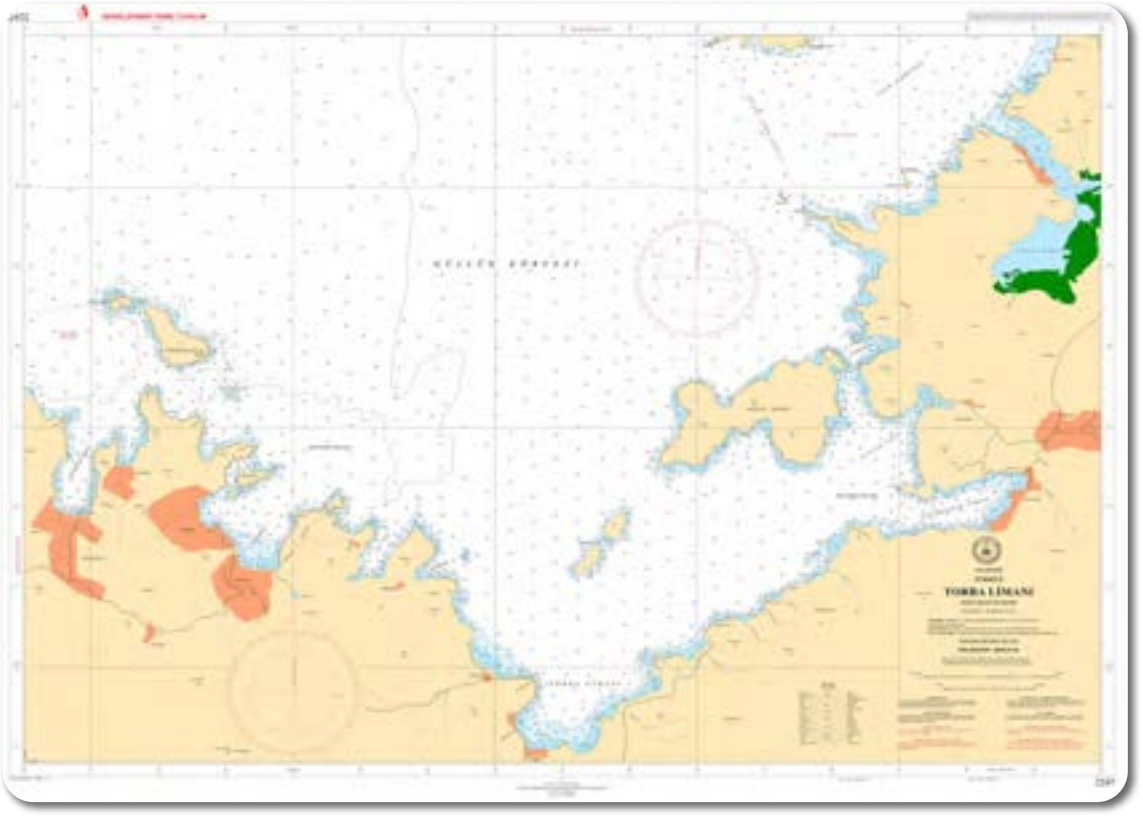


B Match the pictures with the words.



IV. SPEAKING Work in groups and discuss what you can see in the nautical chart below.

e.g., *I can see the chart's title on the right-bottom corner of the chart.*



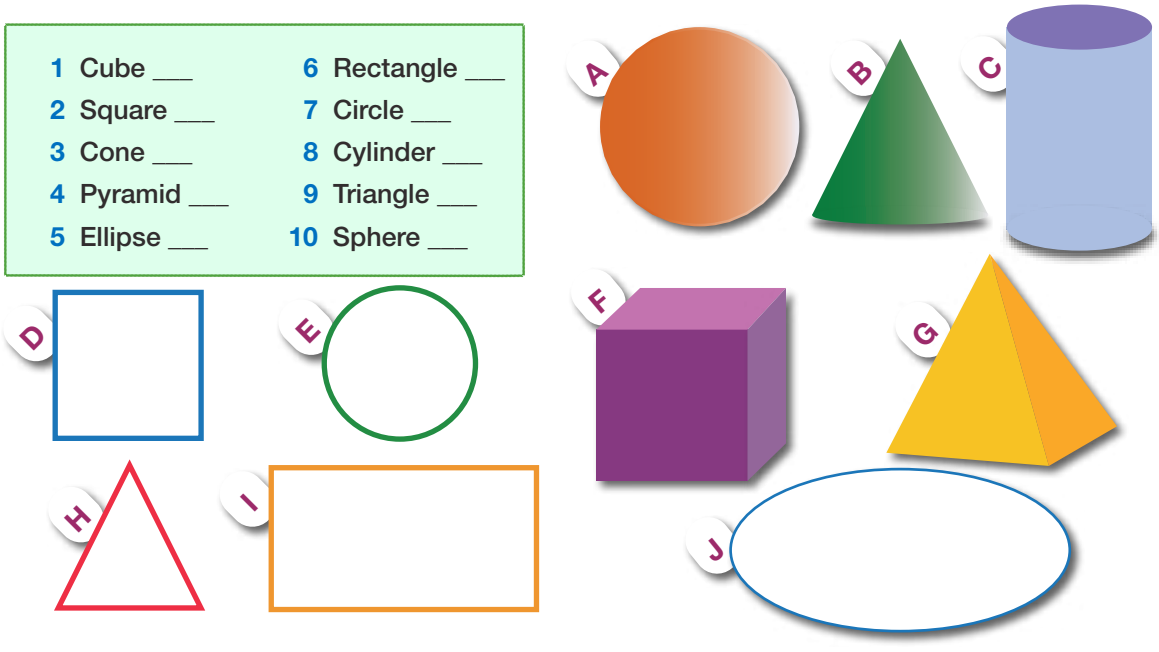
6B NAUTICAL CHARTS AND PUBLICATIONS

V. LEARN THIS

Geometric shapes are usually seen as the mathematics' subject, but we use them to describe the shapes of things in every area of life. Let's revise some of them.

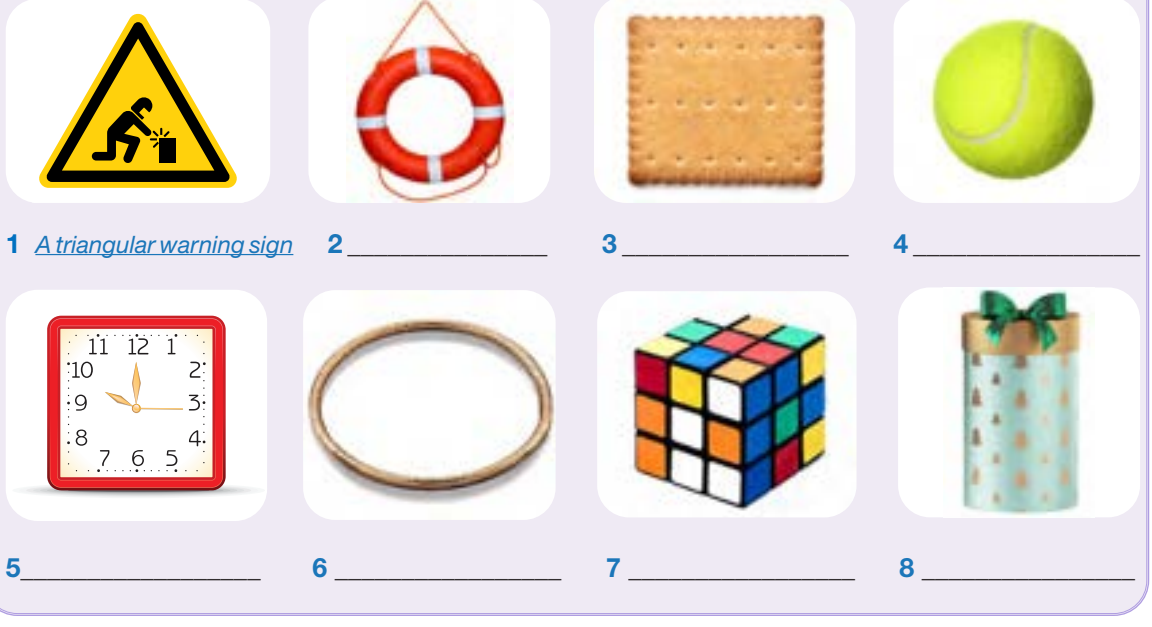
A Match the nouns for geometric shapes with the pictures.

1 Cube ___
2 Square ___
3 Cone ___
4 Pyramid ___
5 Ellipse ___
6 Rectangle ___
7 Circle ___
8 Cylinder ___
9 Triangle ___
10 Sphere ___



B Write the collocations using the correct adjectives from the box.

spherical	cylindrical	rectangular	elliptical	~~triangular~~	circular	square	cubic



1 *A triangular warning sign* 2 _____ 3 _____ 4 _____

5 _____ 6 _____ 7 _____ 8 _____

1 TYPES OF NAUTICAL CHARTS

I. LEAD IN Discuss the following questions in class.

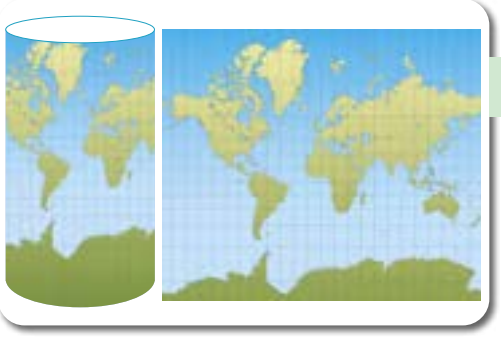
1 Do you know how nautical charts are prepared?

2 What type of nautical charts do you think are commonly used in navigation?

II. READING AND WRITING

A Read the paragraphs about two projection types used in navigation and match the paragraphs with the maps on the right.

___1 **Mercator projection** is widely used on nautical charts. It is a cylindrical projection assuming a rhumb line which is a straight line crossing the meridians with the same angle everywhere. The distance between two meridians will remain the same as the equator since the elliptical shape of the earth is ignored in this type of projection. Therefore, a Mercator projection map is less likely to give true results in the poles than in the equator.



A

___2 **Gnomonic projection** is also used on large scale nautical charts. It shows the shortest route between two points. The meridians and parallels are taken as straight lines, and parallels form great circles. One disadvantage of this type of projection is that the probability of true results decreases remarkably as going further from the centre circle and it can take only one hemisphere at once.



B

B Nautical charts can be classified in three categories depending on their scale: general charts, coastal charts, and harbour charts. Read the paragraphs below and write the correct type of the chart in the gaps. .

General Charts	Coastal Charts	Harbour Charts
1 _____	2 _____	3 _____
are used for navigation when approaching to a harbour or an anchorage. They indicate many details including coastal features, buildings near the coast, tide and current. The scale is larger than 1:50,000.	are used for navigation near coastal areas and inland waters (e.g., Marmara Sea) They include less detail. The scale is between 1:50,000 and 1:100,000.	are used for offshore navigation (e.g., Pacific and Atlantic Oceans, Mediterranean Sea). They do not include a lot of details. They indicate obstacles or hazards such as shoals or reefs. The scale is smaller than 1:100,000.

6B NAUTICAL CHARTS AND PUBLICATIONS

III. VOCABULARY

A Circle the correct forms in bold to complete the sentences meaningfully.

1 **Assume/Assumption** that you are going to an isolated island. What would you take with you?

2 We have won most of the matches we have played, so far. We'll **probably/probability** be the champion.

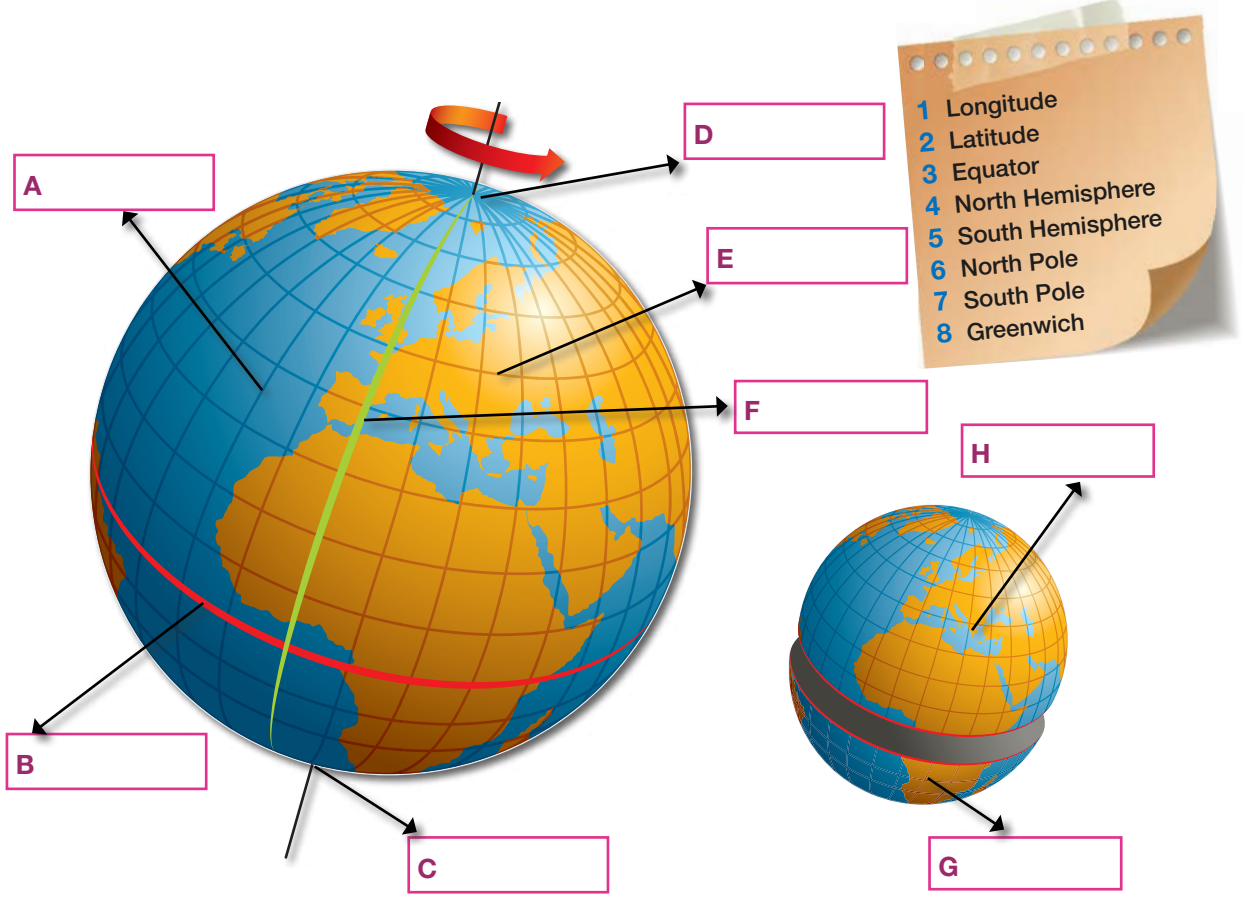
3 I see that you have made a **remarkable/remarkably** change in this place.

4 We cannot **ignore/ignorance** the harms of social media addiction. It causes both physical and mental problems.

5 Who is going to **represent/representation** your school in the competition?

6 **Interpret/Interpretation** of nautical charts needs experience and knowledge.

B Write a word from the box for each part on the picture below.



2 INTERPRETING AND CORRECTING NAUTICAL CHARTS

I. LEAD IN Discuss the following questions in groups.

1 What can you see on a nautical chart?

2 Can you interpret any information on a nautical chart?

II. READING AND WRITING

A Work in pairs. Read the text and fill in the gaps with the given words.

~~chart title~~	yellow	~~white~~	chart number	compass rose	blue
chart symbols	lighter	date	depth curves	correction notes	latitude

What can we see on a nautical chart?

The details indicated on a nautical chart vary according to its type and scale. Nevertheless, we see some certain pieces of information on almost all nautical charts. First of all, all charts have a _____ **(1)** on the top-left and bottom-right corner, and the chart is recorded in the chart catalogue by this number. On all charts, there is a ***chart title*** **(2)** which is shown in a box. It involves a lot of information about the chart and the area it represents. All charts show the _____ **(3)** of first publication. _____ **(4)** are also seen on the bottom-left corner of the chart. They are the recordings of corrections on the chart. There is at least one (usually more than one) _____ **(5)** on all nautical charts which indicates directions. There are variety of _____ **(6)** which give information on many different navigation-related issues such as positions, natural features, landmarks (e.g., bridges, towers, railways), ports, tides, currents, depths, nature of the seabed (e.g., gravel, mud, wrecks, pipelines), obstructions, routes, and aids to navigation (e.g., lighthouse, buoy). There are vertical and horizontal lines crossing each other on all charts which show longitude and _____ **(7)**. There are also longitude scales on the top and the bottom, and latitude scales at both sides of the chart. These scales are used to plot a position. Latitude scales are also utilised to measure the distance between two points.

Additionally, all lines and colours have a meaning on a chart. The land is usually _____ **(8)**, and the colour of the sea is _____ **(9)** in coastal areas. The blue goes _____ **(10)** as the water gets deeper. The water in open seas is in ***white*** **(11)** colour. Except for colours, there are some curved lines on some charts. Those lines are called _____ **(12)** and they are used to show the depth of the water throughout the line. There are also numbers which show soundings in metres or fathoms.

B Read the text again and complete the sentences.

1 On all charts _____ date is indicated.
2 _____ is used to show direction.
3 Chart corrections are recorder on the _____ of the chart.
4 Almost everything is shown with a specific _____ on a chart.
5 _____ are among the aids to navigation.
6 Latitude scales are used to measure _____.
7 Dark blue colour represents _____.
8 Deep water is indicated by _____ colour on a nautical chart.

6B NAUTICAL CHARTS AND PUBLICATIONS

C Read the in formation in the paragraphs and fill in the gaps with the words from the boxes on the right.

Chart Title: A chart title is _____ **(1)** on each nautical chart. It _____ **(2)** information about the name (title) of the chart, the area that the chart_____ **(3)**, the projection type, depths, heights, chart datum, the scale, caution notes, soundings and the publishing authority. The international authority which _____ **(4)** the standards for nautical charting is International Hydrographic Office (IHO).
Chart datum is a level that the depth of water, which _____ **(5)** due to tides displayed on the chart.
Caution notes show various information about pipelines, submarine, exercise area, etc.

- varies
- determines
- represents
- includes
- placed

Chart Scale: The_____ **(1)** indicates a unit corresponding to the _____ **(2)** of the charted area. For example, when you see _____ **(3)** on a chart scale, it means that 100,000 unit in actual size is represented by one unit on the chart. The numerical value on the chart scale is bigger when it indicates_____ **(4)**.

- a smaller area
- actual size
- 1:100,000
- scale of a chart

Compass Rose: A compass rose is a circular symbol on nautical charts around which the numerical values of directions are printed. Compass roses are used to measure_____ **(1)** during navigation. True direction is printed out of circle, and _____ **(2)** direction is printed the inside the circle. The difference between true and magnetic north for the area is called_____ **(3)**. It is located in the center of the compass rose and it is changed_____ **(4)**.

- variation
- annually
- directions
- magnetic

Chart Corrections: Nautical charts are updated and corrected regularly. There are three types of corrections: small correction, large correction and _____ **(1)** Chart Display and Information System (ECDIS) corrections. Large corrections are shown on the new edition in a box, on the bottom-left corner of the chart; small corrections are_____ **(2)** including the number and _____ **(3)** of the correction. ECDIS corrections are_____ **(4)** in Notice to Mariners (NTM), and the corrections are uploaded from a _____ **(5)** source.

- announced
- hand-written
- digital
- electronic
- date

D Read the paragraphs again and complete the sentences with a word or a phrase from the box.

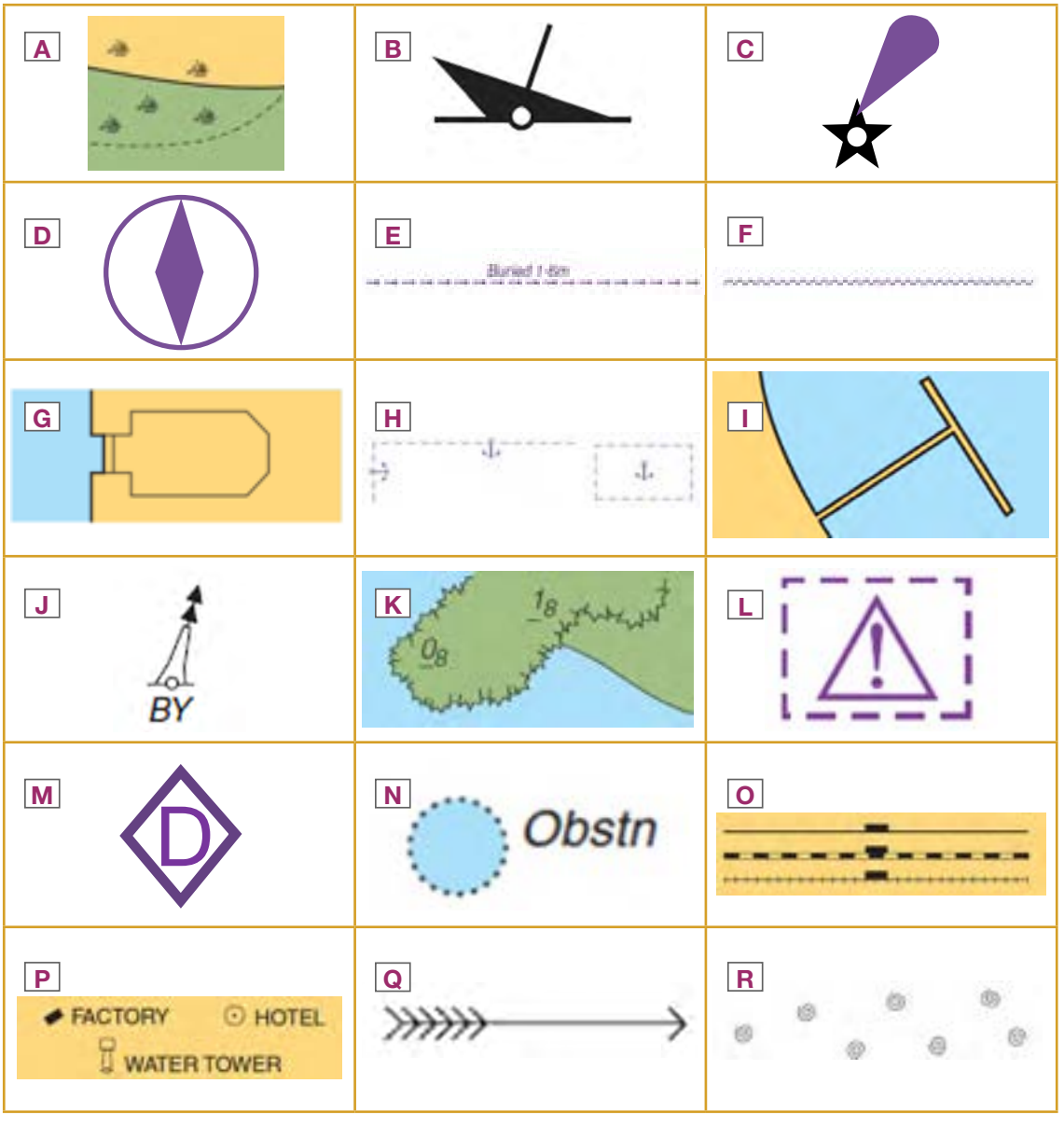
bigger	title	magnetic direction	nautical charts	authority	scale

1 IHO is the international _____ in nautical charting.
2 _____are corrected when necessary, and the corrections are shown on the bottom-left corner.
3 The numerical value of one unit is _____ on the chart scale, when charted area is smaller.
4 Nautical charts can show more or less details depending on the chart _____.
5 Variation is found by calculating the difference between the true direction and the _____.
6 You can obtain a lot of information about the chart and the charted area by looking at the _____ on the chart.

III. VOCABULARY

A Work in pairs and match the interpretations with the chart symbols.

1 lighthouse ***C***	7 anchorage area ___	13 current in restricted waters ___
2 pier, jetty___	8 railway ___	14 landmarks ___
3 eddies ___	9 dry dock, graving dock ___	15 buried pipeline at known depth ___
4 coral reef ___	10 pilot station ___	16 obstruction in unknown depth ___
5 marsh ___	11 submarine cable ***F***	17 partly visible wreck ___
6 buoy ___	12 precautionary area ___	18 tidal stream ***M***

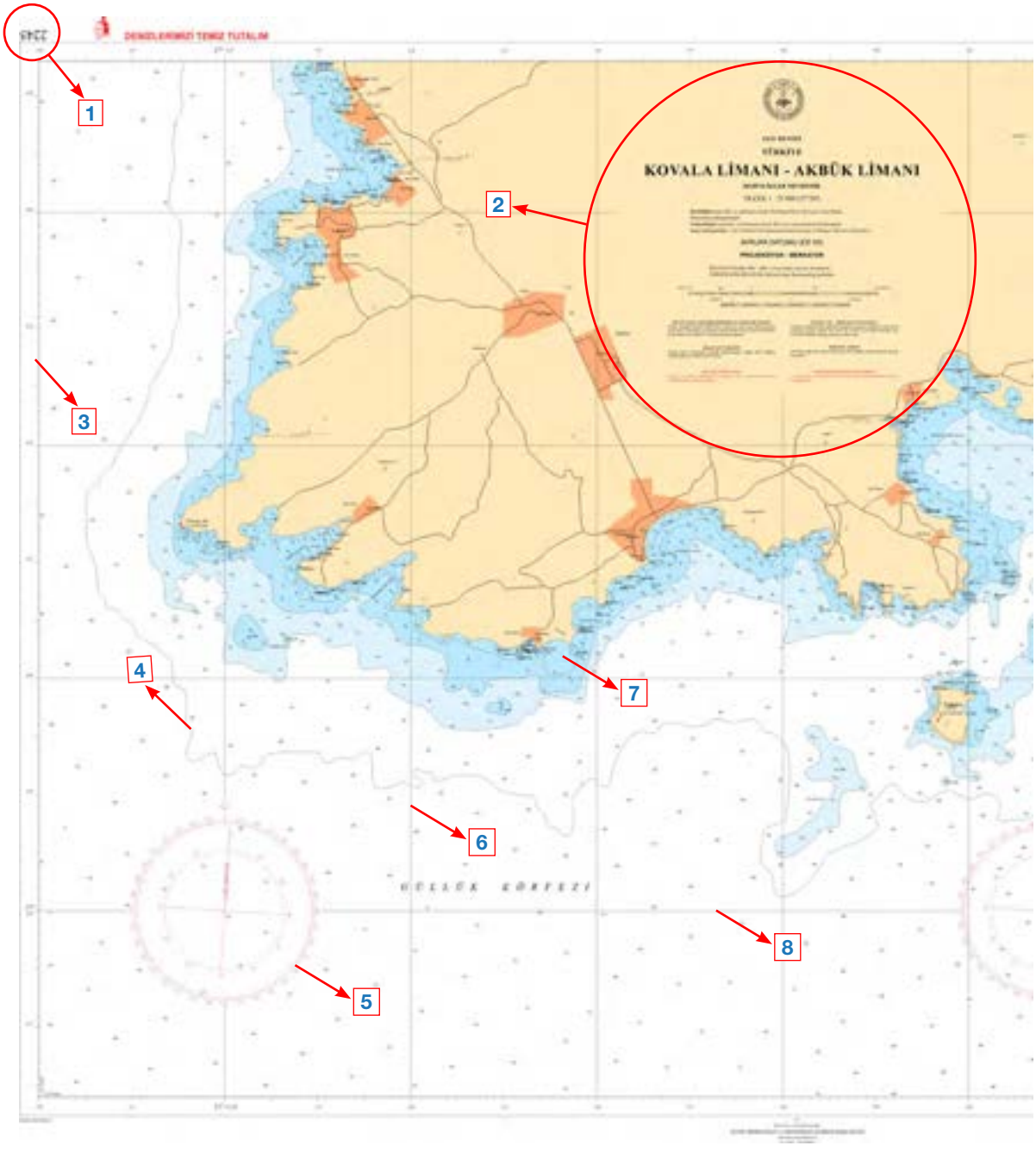


6B NAUTICAL CHARTS AND PUBLICATIONS

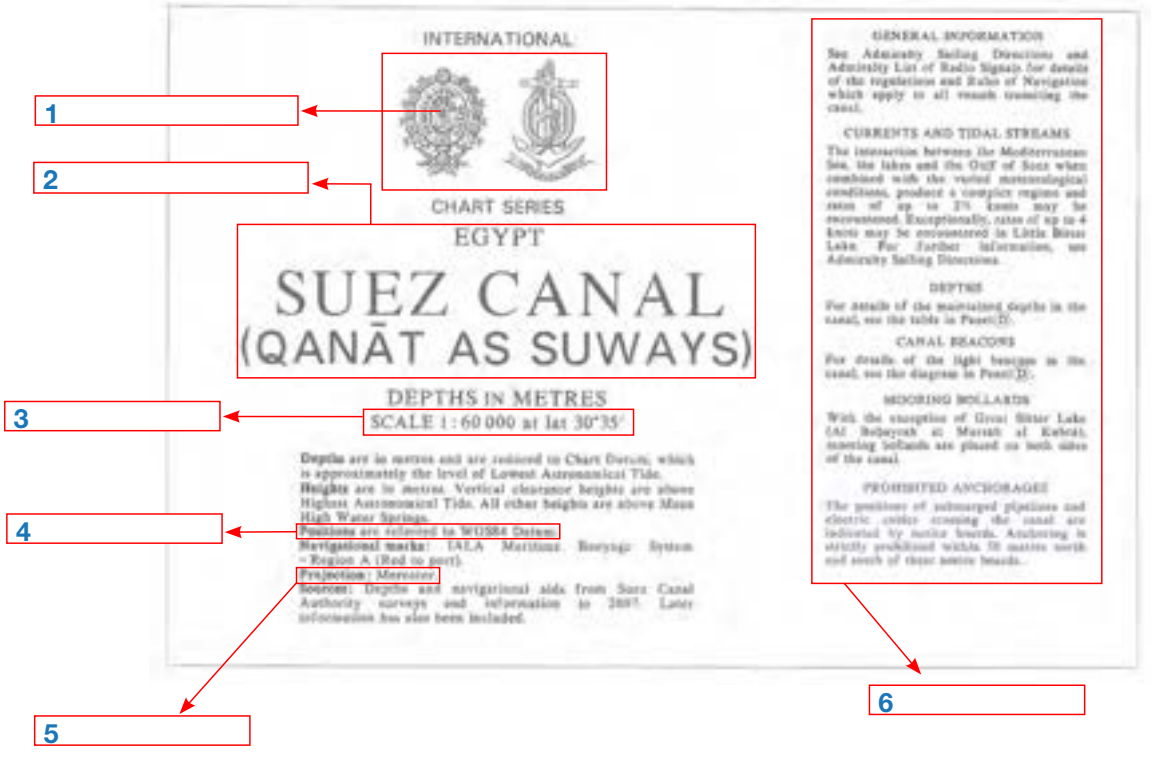
B Look at the map and write the number of the information in the boxes.

	Latitude Scale		Compass Rose
	Depth Curve		Line of Latitude
	Shallow Water		Line of Longitude
	Chart Number		Chart Title





C Work in pairs and write the correct information from the box on the chart title.



IV. LEARN THIS

We use cardinal points and intercardinal points to plot a course, to talk about wind and current directions. There are four cardinal points and four intercardinal points.

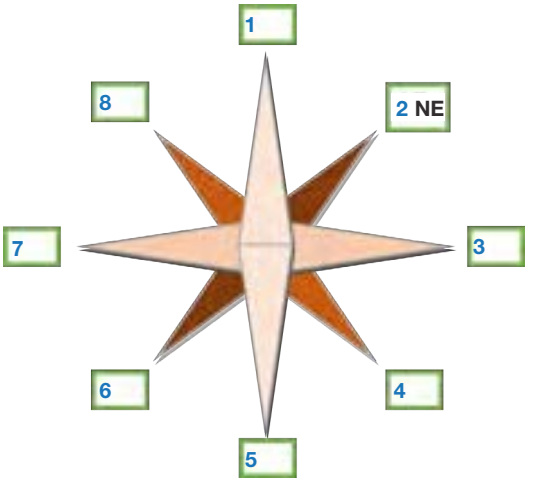
Write the abbreviations of cardinal and intercardinal points on the figure on the right.

CARDINAL POINTS

North (N)
South (S)
West (W)
East (E)

INTERCARDINAL POINTS

North East (NE)
South East (SE)
North West (NW)
South West (SW)



3 NAUTICAL PUBLICATIONS

I. LEAD IN

Nautical publications consist of a series of books, handbooks, periodicals which are handy on the bridge in navigation. There are a number of nautical publications which must be provided on a vessel.

Discuss the following questions.

1 Do you think nautical publications are essential for navigation? Why?/Why not?

2 Do you know where you can find nautical publications?

II. READING AND WRITING

A Study the columns for nautical publications and write the topics in the correct column.

SAFETY AND SECURITY	NAVIGATION	CARGO HANDLING AND STOWAGE
1 _____	2 _____	3 _____
▪ International Maritime Dangerous Goods (IMDG) Code ▪ Code of Safe Practices for Safe Loading/Unloading Bulk Carriers (BLU) Code ▪ International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC) Code ▪ International Safety Guide for Oil Tankers and Terminals (ISGOTT) ▪ International Maritime Solid Bulk Cargoes (IMSBC) Code ▪ International Grain Code	▪ Safety of Life at Sea (SOLAS) ▪ Marine Pollution (MARPOL) ▪ Collision Regulations (COLREG) ▪ Standards of Training Certification and Watchkeeping (STCW) ▪ Load Lines Convention (LLC) ▪ Life Saving Appliance (LSA) Code ▪ Fire Safety System (FSS) Code ▪ International Ship and Port Facility Security (ISPS) Code ▪ International Safety Management (ISM) Code	▪ The Nautical Almanac ▪ Mariner's Handbook ▪ Admiralty List of Lights and Fog Signals (ALL) ▪ Admiralty Tide Tables (ATT) ▪ Admiralty Sailing Directions (ASD) ▪ Admiralty List of Radio Signals (ALRS) ▪ Bridge Procedures Guide ▪ Ship's Routeing ▪ Ocean Passages for the World ▪ Guide to Port Entry

B Write the correct number of nautical publications around the circles of topics.

1 Symbols and Abbreviations Used on Paper Charts & Chart Catalogue

2 International Telecommunication Union (ITU) Publications

3 How to Keep Your Admiralty Products Up-to-Date

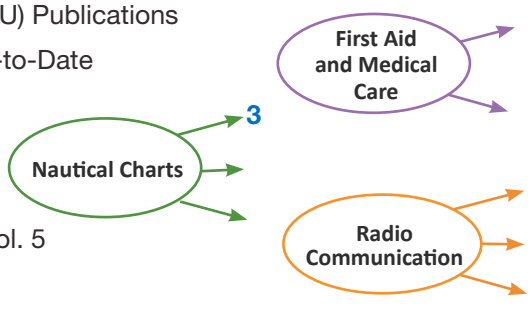
4 The Ship's Captain Medical Guide

5 International Code of Signals

6 International Medical Guide for Ships

7 Admiralty List of Radio Signals (ALRS) – Vol. 5

8 Notices to Mariners



PROJECT

Work in pairs. Find a nautical chart of a region and prepare a presentation telling what is shown on the chart.

INTRODUCTION

I. LEAD IN Discuss the answers to the questions.

1 Do you know the difference between weather and climate?

2 What do you know about the layers of atmosphere? In which layer do weather conditions occur?

3 Do you know how seafarers use the information in the weather report?

II. READING AND VOCABULARY

A Read the paragraph and fill in the gaps with the given words below.

wind	**climate**	**pressure**	**weather**	**precipitation**
troposphere	**humidity**	**temperature**	**meteorology**	**nautical**

METEOROLOGY: Weather or Climate?

_____ **(1)** is the branch of science studying the changes of the atmosphere which surrounds the earth. The sub-branch of meteorology related to the _____ **(2)** matters is called maritime meteorology.

_____ **(3)** refers to current state of atmospheric conditions in short term or the sequence of the states of the atmosphere as time passes. _____ **(4)**, on the other hand, is defined as all the states of the atmosphere seen at a specific region averaged over a long period of time.

Weather conditions take place in the _____ **(5)** layer of the atmosphere. Several factors like heat, air pressure, wind and humidity interact and produce the circumstances which we call the weather conditions. The heat is transferred from the sun, absorbed by the Earth, and spread through the atmosphere. The sun rays strike at different angles on the Earth due to its spherical shape; so, air _____ **(6)** varies from one place to another.

Another element which affects the weather conditions is air _____ **(7)**. The measure of the applied force of the air pressing down on Earth's surface is called air pressure. Since air pressure depends on the density of the air, less dense air exerts less pressure than denser air. Air pressure on Earth varies from one location to another because of the unequal heating of the atmosphere. These differences in the air pressure cause the movement of air which is called _____ **(8)**.

The final element which influences weather conditions is the amount of the_____ **(9)** in the air. Condensation of the humidity in the atmosphere causes the development of the clouds and precipitation falling to the Earth.

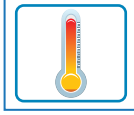
The average weather conditions for a specific region over an extended period of time is called the climate of that region and it is designated as hot, cold, dry, or wet. Temperature and _____ **(10)** are the two main factors to determine the climate of any place. Based on the average temperature and precipitation, the Earth is basically divided into three major climate zones: tropical, temperate and polar. That's how we come up with the difference between the weather and the climate.

B Complete the sentences with the words in Exercise A on Page 195.

1 The _____ change affects all the living things on the Earth.
2 Sahara Desert gets so little amount of _____ that it is the driest place on the Earth.
3 Although the _____ is the thinnest layer of the atmosphere it contains 90% of the mass of the atmosphere.
4 The interaction of the several factors like heat, air pressure, winds and moisture produces _____.
5 The weight of the molecules of the elements in the air causes _____.
6 Death Valley in the South of California has been recorded the highest _____ with 54°C in 2020.
7 In Antalya _____ level is much higher than Ankara.
8 When the _____ starts blowing colder and colder you can understand that the winter is coming.

C Match the words about weather conditions with their pictures.

cold	halo	humid	partly cloudy	hot	overcast	sleet	foggy
lightning	windy	hail	thunderstorm	drizzle	cloudy	sunny	showers


1 _____

9 _____

2 _____

10 _____

3 _____

11 _____

4 _____

12 _____

5 _____

13 _____

6 _____

14 _____

7 _____

15 _____

8 _____

16 _____

D Fill in the gaps with the given words.

a rays
b precipitation
c tropical
d temperate
e polar
f dense

1 It is usually very cold in _____ climate.
2 The fog was so _____ that we couldn't see 1 metre away.
3 In a _____ climate zone, the weather is not too hot or too cold.
4 _____ climate is characterized with high temperatures and lots of rain.
5 The sun _____ comes to the equator with an angle of 90° at noon at equinoxes.
6 _____ refers to any liquid or frozen water particles falling from the atmosphere to the Earth's surface.

III. SPEAKING AND WRITING

Ask and answer the questions about weather in pairs. Then write a short paragraph including your answers to the questions. You can use the words in Exercise B on Page 196 to describe the weather.

1 What's the weather usually like in your hometown?
2 Do you like the weather today? Why?/Why not?
3 What's your favourite weather/season/climate?

e.g., *It's usually warm and sunny in my hometown. I like sunny and warm weather. I don't like cold weather because I hate getting cold or wearing thick clothes. Today it is rainy here. I don't like rain at all. I feel sad when it rains. My favourite season is summer.*

_____
_____
_____
_____
_____

IV. LEARN THIS

A word can be used in different forms (e.g., verb, noun, adjective) depending on its function in the sentence.

e.g., *It's been raining all day that we couldn't see the sunlight today. (verb)*
After the rainy weather it's so good to see the sunshine. (adjective)
There's always enough amount of rain in this region to grow crops. (noun)

Choose the correct form of the words in the sentences and circle them; then say what form of words they are.

1 There has been very little **snow/snowing** in this region this year.
2 It is almost impossible to sail safely in this thick **fog/foggy**.
3 Today the sun is **shiny/shining** brightly, and the sky is very clear.
4 The **icy/ice** sidewalk causes a great danger for the pedestrians.
5 There is plenty of **rainy/rain** fall in this area to produce rice.

1 METEOROLOGICAL INSTRUMENTS

I. LEAD IN

Meteorological instruments are devices measuring the values of atmospheric pressure, humidity, and speed of wind in the air.

Discuss the answers to the following questions in class.

1 Do you know any meteorological instruments?

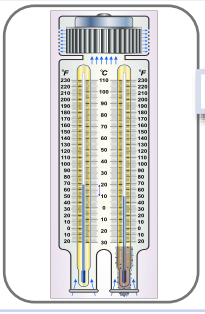
2 Is there a meteorological instrument that you use in everyday life? What do you use it for?

II. READING AND VOCABULARY

A Write the names of the meteorological instruments to complete the paragraphs, and then match them with their pictures.

___ Anemometer ___ Thermometer ___ Psychrometer ___ Barometer


A


B


C


D

1 _____ measures the air temperature by degrees. It can be found at various locations in the accommodation on the vessel.

2 _____ consists of two thermometers: dry bulb and wet bulb. Both measure temperature and humidity; and the difference between the values of the two thermometers is calculated and compared. It is kept in protection boxes on the bridge wings.

3 _____ measures the atmospheric pressure. Aneroid type is used in ships. It is located on the bridge wings.

4 _____ measures the speed and direction of the winds. The one measuring the direction of the wind is called 'juriet'. It is located on the main mast.

B Write the correct measurement unit for each measurement. Choose the units from the box.

Millibar (mb)	N, NNE, NE	Millimetre (mm)
Percentage (%)	Degree Celsius (°C)	Nautical mile (nm)

MEASUREMENTS/READINGS	UNITS
1 Wind direction	
2 Temperature	
3 Visibility	
4 Humidity	
5 Rainfall	
6 Pressure	

C1 Match the weather features on the left with the measurements on the right.

WEATHER FEATURES	MEASUREMENTS
wind direction	2 nm
cloud cover	35 knots
pressure	4 oktas
air temperature	150°
visibility	30°C
wind speed	1010 mb

C2 Put the terms from the Exercise C1 into the correct places.

1 The fog is dense and the _____ is very poor.
2 When the _____ is 90°, it comes from the East.
3 The _____ is 50 knots in Biscay Bay.
4 _____ is at freezing point this morning.
5 A ridge of _____ is increasing up to 1000 mb and moving north.

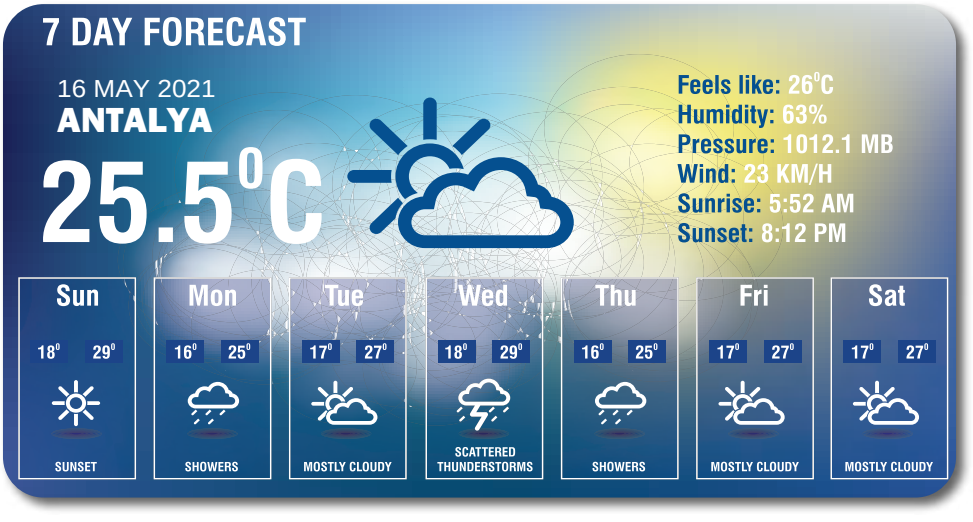
D Match the words on the left with their opposites on the right.

1 backing ___	6 intensifying ___	a poor	f wet
2 excellent ___	7 rough ___	b weakening	g vertically
3 slowly ___	8 thin ___	c thick	h severe
4 increasing ___	9 slight ___	d veering	i smooth
5 horizontally ___	10 dry ___	e rapidly	j decreasing

III. SPEAKING AND WRITING

A Look at the weekly weather forecast for Antalya. Complete the answers and questions. Practice the dialogue with your partner. Use the clues from the chart.

e.g., *What's the weather like in Ankara today?*
It's mostly sunny. The temperature is 20 degrees Celsius.



6C METEOROLOGY

A

1 What's the _____ like in Antalya today?
2 What's the air _____ in Antalya today?
3 What's the real feel _____ today?
4 What's the _____ rate?
5 What's the air _____?
6 What's the_____ force?
7 What _____ is the sunrise?
8 What time is the _____?

B

1 _____
2 _____°C.
3 _____°C.
4 _____%.
5 _____mb.
6 _____km/h.
7 _____a.m.
8 _____p.m.

B **Imagine that you are going to present the weekly weather forecast on the radio. Look at the chart in Exercise A on Page 199 and write a report about the weekly weather conditions for Antalya.**

e.g., *On Monday, it's going to be partly cloudy, but warmer than Sunday.*

_____
_____
_____
_____
_____

IV. LEARN THIS

We use be going to + verb to talk about future intentions and plans or predictions about the things that we are certain to happen in the future or when we have evidence for now.

e.g., *It isn't going to stop raining soon. (The speaker can probably see the dark rain clouds.)*

Look out! You are going to fall from the ladder. (The speaker can see that it's a dangerous position.)

Are they going to finish the work tomorrow? (The speaker asks if there's evidence about it.)

Complete the sentences with the correct form of 'be going to' and the verbs in brackets.

1 We _____ **(have)** a busy afternoon.
2 There _____ **(be)** a thunderstorm in the next 24 hours.
3 _____ they _____ **(get)** married next month?
4 She _____ **(not come)** to the party because she has an important meeting at that time.
5 I _____ **(become)** a sailor when I finish this school.

2 PRESSURE SYSTEMS

I. LEAD IN Discuss the answers to the following questions in class.

1 What do you know about pressure systems?

2 Why is it important to study and know about pressure systems for seafarers?

II. READING AND VOCABULARY

A Complete the sentences with the given terms about the pressure systems and winds with your partner.

divergence - ~~veering~~ - backing – cold front - trough - isobar - high pressure system - low pressure system – warm front - tropical cyclone - ~~ridge~~ – ~~convergence~~

There are two kinds of pressure systems: **low pressure system** and **high pressure system.**

1 A _____or a cyclone has lower pressure than 1013 mb at its centre than the areas around it. Air flows towards the centre.

2 A _____ or an anticyclone has higher pressure than 1013 mb at its centre than the areas around it. Air flows from the centre towards the areas around it.

3 _____ is used to determine the winds moving anti-clockwise in the pressure systems. The winds move anti-clockwise around the low-pressure systems in the northern hemisphere, and around the high-pressure systems in the southern hemisphere.

4 ___*Veering*___ is used to determine the winds moving clockwise in a pressure system. The winds move clockwise around high-pressure systems in the northern hemisphere, and around a low-pressure system in the southern hemisphere.

5 _____ is an elliptic line drawn on a weather map connecting the points of the same atmospheric pressure around the pressure systems.

6 _____ is the situation that isobar curves are in “V” or “U” form in a low pressure zone.

7 ___*Ridge*___ is a curvilinear isobar system where the pressure increases towards the centre.

8 A _____ occurs when a cold air mass meets a warm air mass and pushes it up.

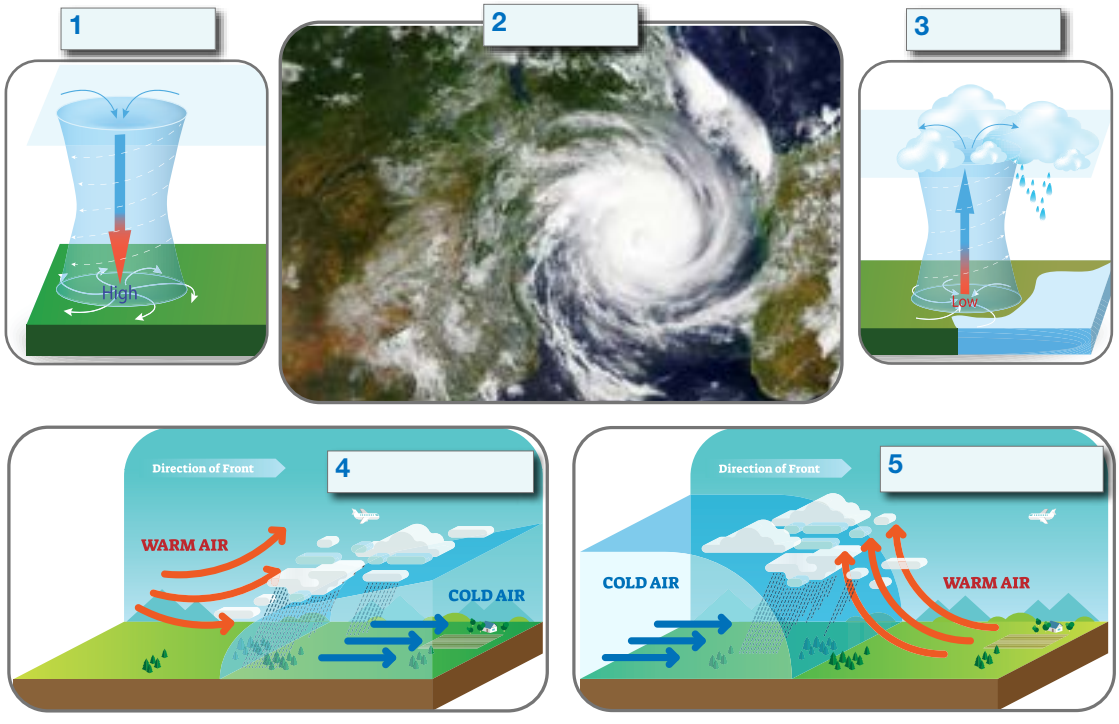
9 A _____ occurs when a warm air mass catches up with a cold air mass and moves over it.

10 A _____ is a kind of rotating storm for which occurs over tropical waters. It rapidly moves from the surroundings to the eye forming a kind of whirlpool.

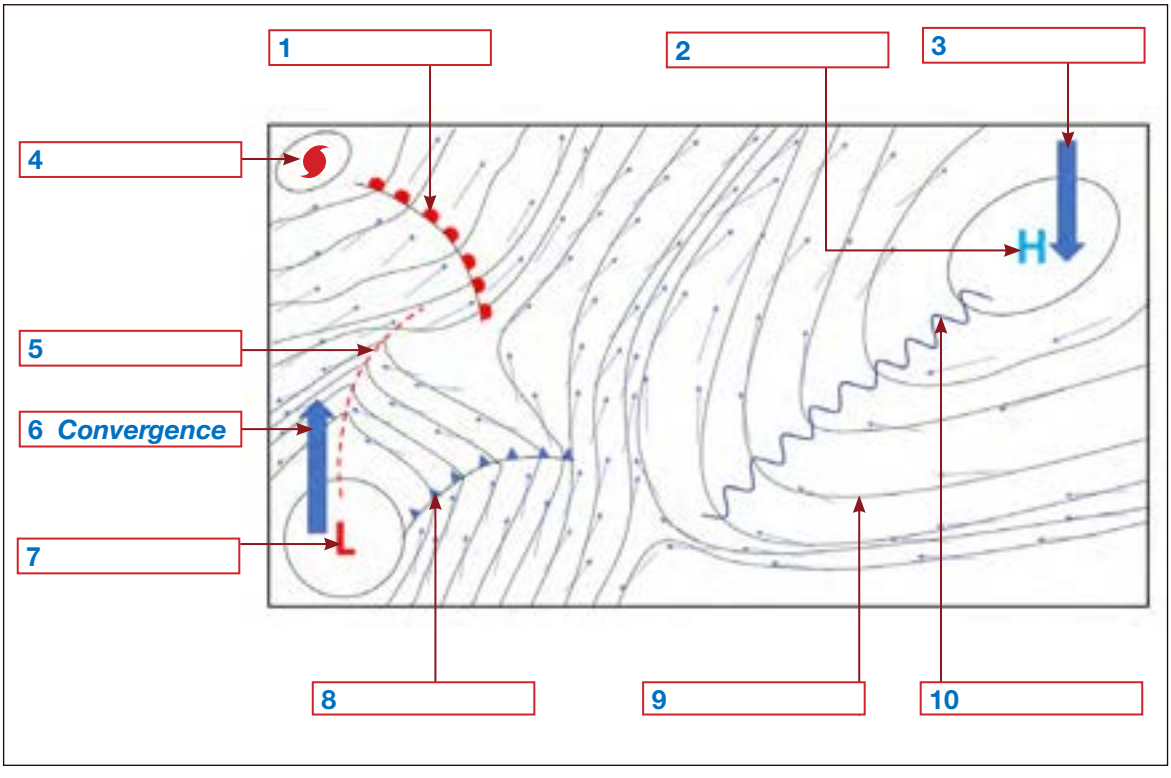
11 _____ of air flow causes the air mass to rise in low pressure areas.

12 ___*Convergence*___ of air flow causes the air mass to move downward in high pressure areas.

B Write the terms from Exercise A on Page 201 on the pictures below.



C Look at the map and write the correct terms from Exercise A on Page 201 on in the boxes.



3 WEATHER REPORTS

I. LEAD IN

It is very important for seafarers and meteorologists to study clouds and their movements since we can infer how the weather is going to be by looking at their development.

Discuss the answers to the questions below. Share your experiences and views.

1 What do you know about types of clouds?

2 Do you ever observe the clouds in the sky and try to guess the coming weather?

II. READING AND WRITING

A Read the text and write if the statements in the box are TRUE or FALSE.

CLOUDS

Clouds are made of very small and thin droplets of water that cling to pieces of dust. They can float in the air and travel held up by the wind. When drops become too heavy to stay up in the air with the help of the wind, they end up falling to the Earth as rain, snow, hail, or sleet. According to their altitude they can be classified as **high clouds**, **mid-level clouds** and **low clouds**.

High clouds are Cirrus, Cirrocumulus and Cirrostratus. **Cirrus** clouds consist of tiny ice crystals. They are thin, wispy, feather-like clouds. They indicate unstable weather or a possible change in weather conditions. **Cirrocumulus** clouds are thin and white. They look like a sprinkle of sand or grain in small pieces. They are seen when the weather is fair, but when they are seen in a tropical climate, they might indicate that an approaching hurricane. **Cirrostratus** clouds are also thin and white; but they look like a veil covering the sky. In winter, they might form a halo around the moon or the sun, and it enables us to predict a rain or a snow within 24 hours.

Mid-level clouds are Altocumulus and Altostratus. **Altocumulus** clouds are in small patches, usually greyish white. The weather is usually fair, and they don't usually bring precipitation. Rainbows can be seen with these clouds. **Altostratus** clouds can be greyish or blue. They usually cover the sky like a veil. They indicate a coming rain which will be continuous.

Low clouds which occur below 2000 metres are Cumulus, Stratus, Stratocumulus and Nimbostratus. **Cumulus** clouds have flat bases and rounded tops, and they look like big puffs of cotton piles in the sky. We can see Cumulus when the weather is nice; that's why people call them "fair weather clouds" but they sometimes produce showers. **Stratus** clouds are grey, flat layered clouds that look like a grey blanket covering the sky. They often produce a light rain called drizzle. **Stratocumulus** clouds are grey and white clouds which look like honeycombs. The weather is usually nice when these clouds are seen, but they can bring an intermittent rain. **Nimbostratus** clouds are thick and dark grey clouds. They can rise to higher altitudes and can be seen as mid-level clouds. They indicate continuous snow or rain.

Cumulonimbus is another type of rain cloud which can grow into a giant by its heaping nature with a base only starting at 1200 metres above the ground with a top about 12000 metres. If we see cumulonimbus clouds in the sky, we should be prepared for showers, lightning, thunder or hail.

1 Cumulus clouds are seen when the weather is nice. _____

2 Clouds may appear only higher than 2000 metres. _____

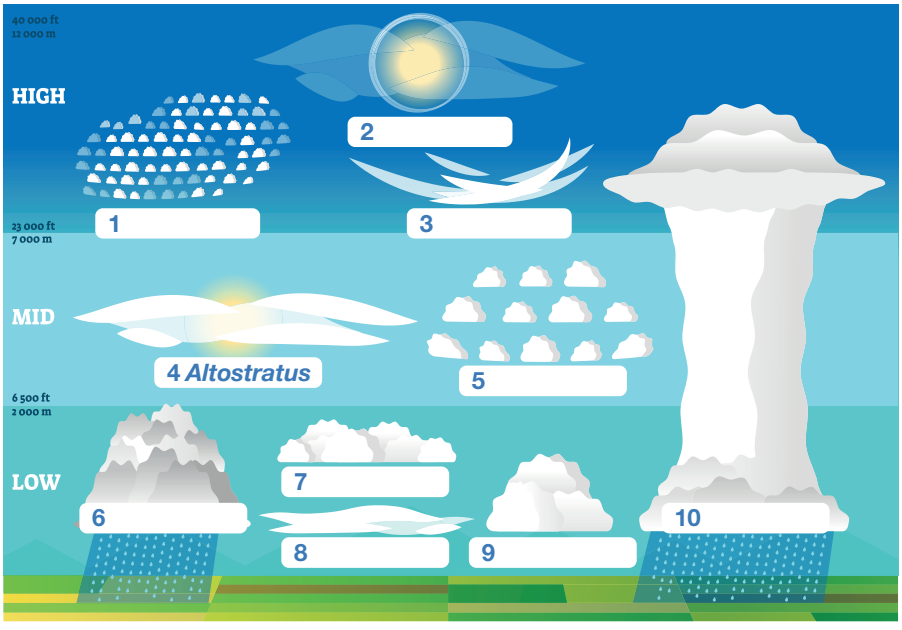
3 Nimbostratus clouds most probably produce rain or snow. _____

4 Clouds always have the same shape and colour. _____

5 Every kind of cloud may produce precipitation. _____

6 Cumulonimbus clouds can bring precipitation. _____

B Read the text again and write the cloud names under their pictures.



C Certain clouds are associated with certain weather conditions. Fill in the missing information on the table. Check your answers from the paragraphs in Exercise A on Page 203.

STRATUS	NIMBOSTRATUS	CUMULONIMBUS	CIRROSTRATUS	ALTOSTRATUS	CUMULUS
1 **D**_____	Rain	Showers	4 **H**_____	5 **R**_____	6 **S**_____
	Snow	2 **L**_____	Rain		
		3 **T**_____	Snow		

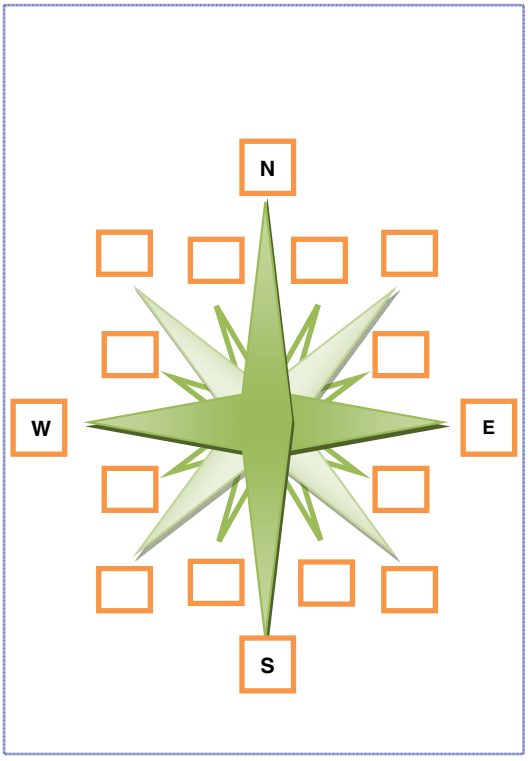
III. VOCABULARY

A Match the words with their definitions.

1	**breeze**__	**a** small drops of water on the grass that occurs at night or early morning
2	**hurricane**__	**b** a light fog which consists of small droplets of water
3	**precipitation**__	**c** any form of condensed water like snow, rain or sleet that falls on the ground
4	**gale**__	**d** a thin layer of white ice crystals on the ground
5	**mist**__	**e** a mixture of water, dust or other particles in the air which forms a light mist
6	**frost**__	**f** a light cool wind
7	**dew**__	**g** a strong wind
8	**haze**__	**h** a huge rotating storm in tropical areas

B Complete the table using the given information about wind directions and their abbreviations, and then label the points on the compass rose.

WIND DIRECTION ABBREVIATIONS	
Name	**Abbreviation**
1 _____	N
North-Northeast	2 _____
Northeast	NE
East-Northeast	ENE
3 _____	E
East-Southeast	4 _____
Southeast	SE
South-Southeast	SSE
5 _____	S
South-Southwest	6 _____
Southwest	SW
West-Southwest	7 _____
8 _____	W
West-Northwest	9 _____
Northwest	NW
North-Northwest	10 _____



C Check the meanings of the words in the box and fill in the missing parts of the chart with these words.

FOG AND VISIBILITY SCALE		
Code	**Name**	**Visibility**
0	_____ **(a)** Fog	Less than 45 metres
1	_____ **(b)** Fog	Less than 180 metres
2	Fog	Less than 360 metres
3	_____ **(c)** Fog	Less than 0.5 nm
4	Thin Fog	Less than 1 nm
5	_____**(d)** Visibility	Less than 2 nm
6	Moderate Visibility	Less than 5 nm
7	Good Visibility	Less than 10 nm
8	_____**(e)** Visibility	Less than 30 nm
9	_____**(f)** Visibility	More than 30 nm



D Complete the sentences with the given words.

sprinkled	wavelets	phenomena	altitude	droplets

1 Rainbow and halo are weather _____ which occur as a result of light refraction.

2 When there is a light wind, the sea is smooth, and you can see small _____ on water.

3 There was no rain at all, it only _____ a little in the morning.

4 It gets harder for people to breathe in high _____.

5 It gets really cold at night here. There is always small _____ of water on the plants in the morning.

E Match the words on the left with their synonyms on the right.

1 rippled ____	a stormy
2 tiny ____	b thin, feathery
3 wispy ____	c cool
4 squally ____	d wavy
5 chilly ____	e very small

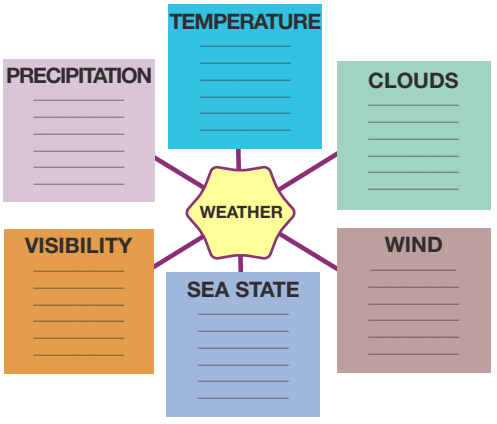
F Complete the missing explanations according to the code letters in the sky state abbreviation chart below.

SKY STATE ABBREVIATIONS			
Code	**Explanation**	**Code**	**Explanation**
b	B_____ (0/8 clouded)	q	Squally weather
bc	Partly cloudy (3-5/8 clouded)	r	Rain
c	C_____ (6-8/8 clouded)	rs	S_____ (Rain and snow together)
d	D_____	s	Snow
e	Wet air	t	T_____
f	F_____	u	U_____
g	G_____	v	Pure air (Abnormal visibility)
h	H_____	w	Dew
l	L_____	x	Hoar frost
m	M_____	y	Dry air
o	O_____ (The sky completely covered with a layer of thick or heavy cloud)	z	Haze
p	Passing showers		

Lightning
Thunder
Drizzle
Ugly, threatening sky
Mist
Overcast sky
Blue sky
Hail
Sleet
Gale
Fog
Cloudy

G Write the words under the correct titles on the spider web.

1 drizzle
2 gale
3 dense fog
4 warm
5 excellent
6 rain
7 backing
8 partly cloudy
9 phenomenal
10 overcast
11 calm (glassy)
12 freezing



13 breeze
14 hail
15 blue sky
16 chilly
17 rough
18 poor
19 smooth
20 veering
21 cool
22 halo
23 snow
24 haze

IV. SPEAKING AND WRITING

A Study the observation table for wind force state and sea state, then ask and answer questions with your partner as in the example.

e.g., *What's the wind between 4 and 6 knots?* — *It's light breeze.*
What's the Beaufort code for light breeze? — *It's 2 Beaufort.*
What's the sea state? — *It's calm and rippled.*
What's the sea state code for calm, rippled sea? — *It's 1 (one).*

OBSERVATION TABLE

WIND FORCE (Beaufort Scale) STATE				SEA STATE		
Code	Name	Knots	Metres Per Second	Code	Name	Height of Waves (metres)
0	Calm	0-1	0-0.2	0	Calm (glassy)	0
1	Light Air	1-3	0.3-1.5			
2	Light Breeze	4-6	1.6-3.3	1	Calm (rippled)	0-0.10
3	Gentle Breeze	7-10	3.4-5.4	2	Smooth (wavelets)	0.10-0.50
4	Moderate Breeze	11-16	5.5-7.9	3	Slight	0.50-1.25
5	Fresh Breeze	17-21	8.0-10.7	4	Moderate	1.25-2.50
6	Strong Breeze	22-27	10.8-13.8	5	Rough	2.50-4.00
7	Near Gale	28-33	13.9-17.1	6	Very Rough	4.00-6.00
8	Gale	34-40	17.2-20.7			
9	Strong Gale	41-47	20.8-24.4			
10	Storm	48-55	24.5-28.4	7	High	6.00-9.00
11	Violent Storm	56-63	28.5-32.6	8	Very High	9.00-14.00
12	Hurricane	64-71	32.7-36.9	9	Phenomenal	14.00-Above
13	Hurricane	72-80	37.0-41.4			
14	Hurricane	81-89	41.5-46.1			
15	Hurricane	90-99	46.2-50.9			
16	Hurricane	100-108	51.0-56.0			
17	Hurricane	109-118	56.1-61.0			

** Beaufort is a scale which is used to observe wind characteristics and wind force at sea.*

B Deck log book meteorological recordings include numerical values of weather conditions and the sea. These recordings are recorded every hour according to the reference charts at the beginning of the deck log book.

Look at the chart below taken from a deck log book. Complete the entries with the correct codes and numbers according to the observations given. The first entries are completed as an example (To complete this activity, look at the meteorological charts or tables on Pages 205,206 and 207.).

TIME (LT)	WIND		SEA STATE	WEATHER		BARO METER	AIR	
	Direction	Force		Sky	Visibity		Dry	Wet
1200	*NW*	*6*	*5*	*c,r*	*6*	*1012*	*12*	*10*

ENTRY 1		ENTRY 2	
TIME	*1200 LT*	**TIME**	1300 LT
WIND	*NORTHWEST- STRONG BREEZE*	**WIND**	NORTH-NORTHWEST – NEAR GALE
SEA STATE	*ROUGH*	**SEA STATE**	VERY ROUGH
WEATHER	*CLOUDY, RAIN*	**WEATHER**	OVERCAST SKY, DRIZZLE
VISIBILITY	*MODERATE*	**VISIBILITY**	POOR
BAROMETER	*1012 mb*	**BAROMETER**	1010 mb
AIR (TEMP.)	*DRY: 12°C WET:10°C*	**AIR (TEMP.)**	DRY: 9°C WET:8°C
ENTRY 3		**ENTRY 4**	
TIME	1400 LT	**TIME**	1500 LT
WIND	WEST-NORTHWEST – GALE	**WIND**	WEST- STORM
SEA STATE	VERY ROUGH	**SEA STATE**	HIGH
WEATHER	OVERCAST SKY, SLEET	**WEATHER**	OVERCAST SKY, SNOW, LIGHTNING
VISIBILITY	POOR	**VISIBILITY**	POOR
BAROMETER	1008 mb	**BAROMETER**	1006 mb
AIR (TEMP.)	DRY: 3°C WET:2°C	**AIR (TEMP.)**	DRY: 2°C WET:0°C
ENTRY 5		**ENTRY 6**	
TIME	1600 LT	**TIME**	1700 LT
WIND	WEST-SOUTHWEST – HURRICANE (65 kts)	**WIND**	SOUTHWEST – LIGHT BREEZE
SEA STATE	PHENOMENAL	**SEA STATE**	CALM (RIPPLED)
WEATHER	OVERCAST SKY, HAIL, SNOW	**WEATHER**	BLUE SKY
VISIBILITY	POOR	**VISIBILITY**	VERY GOOD
BAROMETER	1000 mb	**BAROMETER**	1012 mb
AIR (TEMP.)	DRY: 0°C WET: -1°C	**AIR (TEMP.)**	DRY: 6°C WET: 2°C

PROJECT Work in groups. Prepare a weather report for a navigational area using the information you have learned. Give details about temperature, pressure, wind speed and direction, sea state, sky state and visibility. Use visual materials like pictures, charts etc.

SELF ASSESSMENT 6	1	2	3
1 I can tell what qualities seamanship require in English.			
2 I can talk about the routine maintenance work on board.			
3 I can give and respond to basic wheel and engine orders.			
4 I can read the basic information on a nautical chart.			
5 I can tell what kind of nautical publications are required on the bridge.			
6 I can talk about weather conditions.			
7 I can tell the basic information on a weather report.			
8 I can understand the recordings about weather and sea conditions in a deck log book.			

REVISION 6

A Odd one out.

1	**scraper**	**grease gun**	**wire brush**	**chipping hammer**
2	**painting**	**lubricating**	**chipping**	**anchoring**
3	**heave up**	**ease to twenty**	**meet her**	**port ten**
4	**full ahead**	**stand by engine**	**half astern**	**steady**
5	**bow line**	**bollard**	**cleat**	**fairlead**
6	**lighthouse**	**chart catalogue**	**anchorage area**	**landmarks**

B Choose the correct item.

1 _____ is not scheduled as a planned maintenance of a vessel.

- **A** Predictive maintenance
- **B** Breakdown maintenance
- **C** Preventive maintenance
- **D** Dry dock

2 _____ is among actions taken to prevent corrosion on metal surfaces of a vessel.

- **A** Lubricating
- **B** Sounding
- **C** Painting
- **D** Measuring

3 _____ is an engine order.

- **A** Dead slow astern
- **B** Hard-a-port
- **C** Midships
- **D** Meet her

4 "Nothing to starboard" means _____.

- **A** Rudder to be held in the forward and after position
- **B** Check the swing of the vessel's head in a turn
- **C** Avoid allowing the vessel's head to go to starboard
- **D** Rudder to be held fully over to starboard

5 When you require the officer in charge to be prepared and wait for dropping the port anchor, you give the order: "_____"

A Put the windlass in gear.
B Stand by for letting go the port anchor.
C Heave up the port anchor.
D Let go the port anchor.

6 _____ is not written on the chart title.

A Notice to mariners
B Publishing authority seal
C Projection type
D The scale of the chart

7 Land is shown using _____colour on a nautical chart.

A dark blue **B** white
C light blue **D** yellow

8 _____ is a nautical publication related to safety.

A IMSBC
B The Nautical Almanac
C SOLAS
D Guide to Port Entry

9 _____ values are expressed by knots as measurement unit.

A Wind speed **B** Pressure
C Wind direction **D** Humidity

10 A _____ is a ring of colourful light surrounding the sun or the moon which is seen behind thin clouds.

A hail **B** drizzle
C rainbow **D** halo

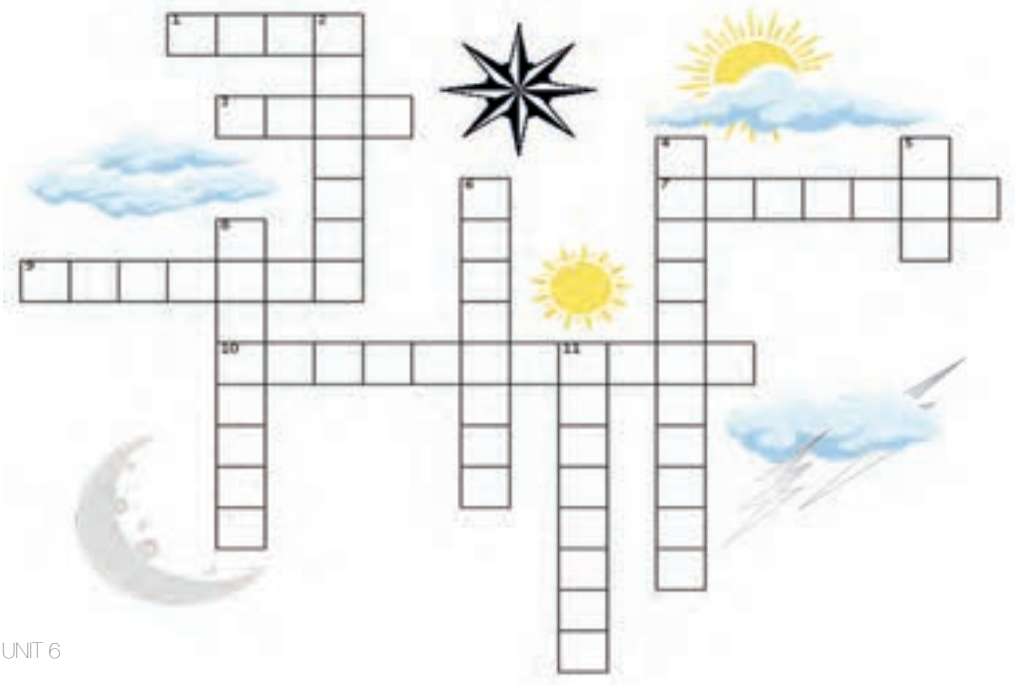
C Read the clues and do the puzzle.

ACROSS

1 We need it to blow to fly a kite.
3 Drought occurs when there's little or no _____ for a long period.
7 It's an imaginary line which divides a planet into two hemispheres.
9 Its change affects every living thing on Earth.
10 Almost all weather conditions occur here.

DOWN

2 It's a kind of rain in tiny, light drops.
4 If it's measured high in our body, it might mean we're sick.
5 This cloud is so low that we can even touch it.
6 When it decreases, also the amount of oxygen decreases.
8 It means something is related to ships, sailing or sailors.
11 It's the measurement of the quantity of water in the air.





7 MARINE ELECTRICS AND ELECTRONICS

In this unit, you will...

- talk about routine maintenance work and basic maintenance equipment on board
- get familiar with manoeuvring equipment and orders
- tell what you can see on a navigational chart
- tell the names and scope of basic nautical publications
- talk about general meteorological terms and weather forecast
- recognise weather instruments and tell what they are used to measure
- get familiar with pressure systems
- get familiar with weather reports and deck log book entries about meteorology

MARINE ELECTRICS AND ELECTRONICS

7A MARINE ELECTRIC MACHINERY

I. LEAD IN

Marine electric machinery consist of electric motors, generators and transformers.

Discuss the following questions with your classmates.

1 What do you know about the functions of electric machinery on a vessel?
2 Do you know how they work?

II. VOCABULARY AND READING

A Match the words with their definitions.

1 magnet____
2 current____
3 circuit____
4 voltage___
5 conduct___

a the potential energy difference between two points on a circuit expressed in volts
b to transmit, to convey
c a flow of electricity
d a material that can produce a magnetic field around itself and attract iron and other metal objects
e a system including the electrical source and the path, through which the electricity can flow via wires, pipes etc.

B Match the words to form meaningful collocations. Check the meanings in your dictionaries.

1 operating ____
2 nominal _____
3 magnetic ____
4 power _____
5 revolution _____
6 electrical _____

a field
b per minute
c frequency
d current
e load
f supply

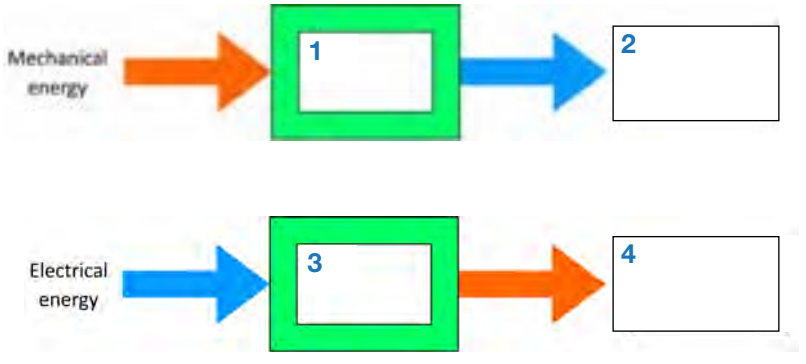
C1 Read the paragraphs about electric motors and generators below and complete them with the given words in the box.

source	**electrical**	**in contrast with**	**pumping**
auxiliary	**emergency**	**mechanical**	**direct**

Electric motors convert electrical energy into _____ **(1)** energy. They are used for various onboard systems such as cargo loading/discharging, manoeuvring and _____ **(2)**. They might be alternating current (AC) motors, _____ **(3)** current (DC) motors, and some special kinds of motors used on board.

Generators convert mechanical energy into electrical energy _____ **(4)** electric motors. Main generators produce _____ **(5)** energy for all systems on a vessel using diesel motors as mechanical energy _____ **(6)**. There are several _____ **(7)** generators which help the main generator in producing electrical energy like shaft generators. They use variety of mechanical energy sources. In addition to these, _____ **(8)** generators are also kept standby in case of an emergency. AC generators and DC generators are the types of generators used in ships.

C2 Read the paragraphs in Exercise C1 **again** and complete the missing information on the diagrams below.



C3 Answer the following questions using the information in Exercise C1 and C2.

1 What are electric motors used for on a vessel?

2 What are the types of electric motors?

3 What is the main function of generators on a vessel?

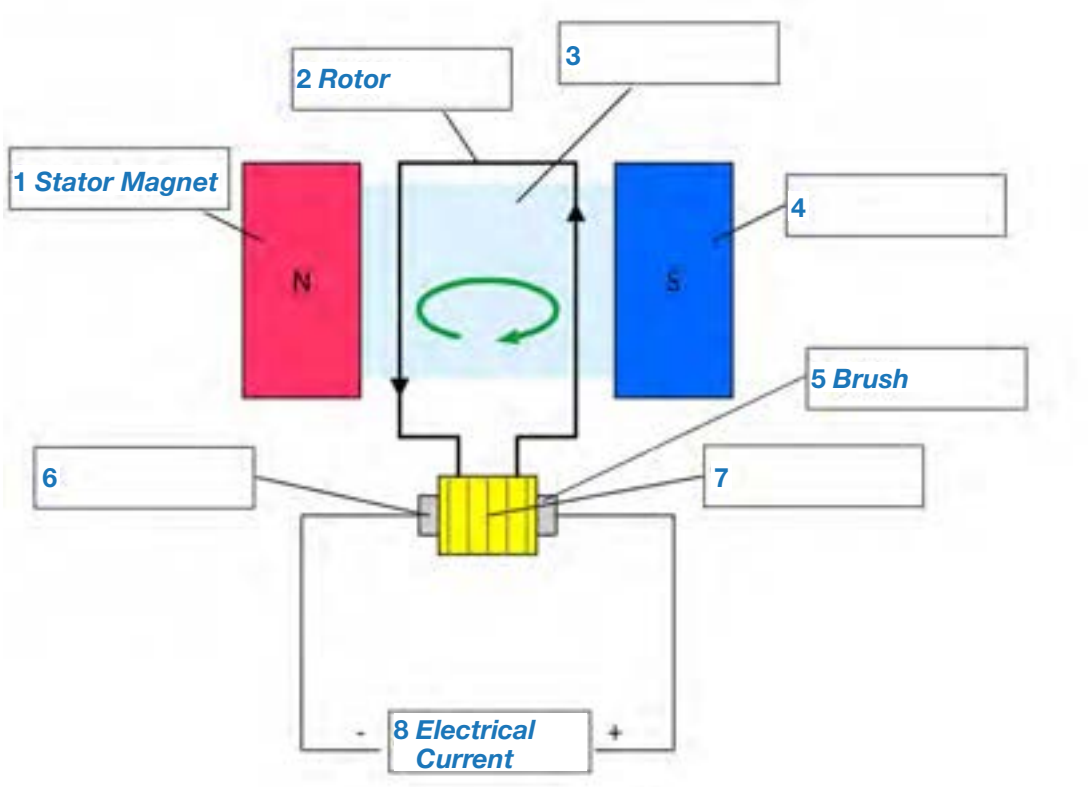
4 What is the purpose of having an emergency generator on board?

5 What are the differences of electric motors and generators?

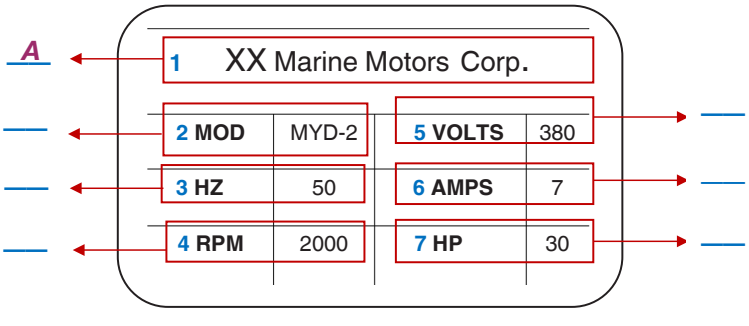
7A MARINE ELECTRIC MACHINERY

D Read the paragraph below and write the missing components of electric motors and generators on the diagram from the phrases in bold.

Both electric motors and generators have stator magnets, a rotor, a rotating commutator, and brushes. **Stator magnets** generate a **magnetic field** between two poles, and the **rotor** revolves in this magnetic field. **Commutator** maintains the direction of the electrical current between the external power supply and the rotor. **Brushes** conduct **electrical current** by touching and brushing against commutator segments.



E Look at the sample label of an electric motor and write the correct letters of the information in the boxes using the clues.



- A ~~The Manufacturer~~
- B Revolution per Minute
- C Nominal Power (Kilowatt /Horsepower)
- D Nominal Load Current (Ampere)
- E The type of the motor
- F Operating Frequency (Hertz)
- G Voltage

III. WRITING

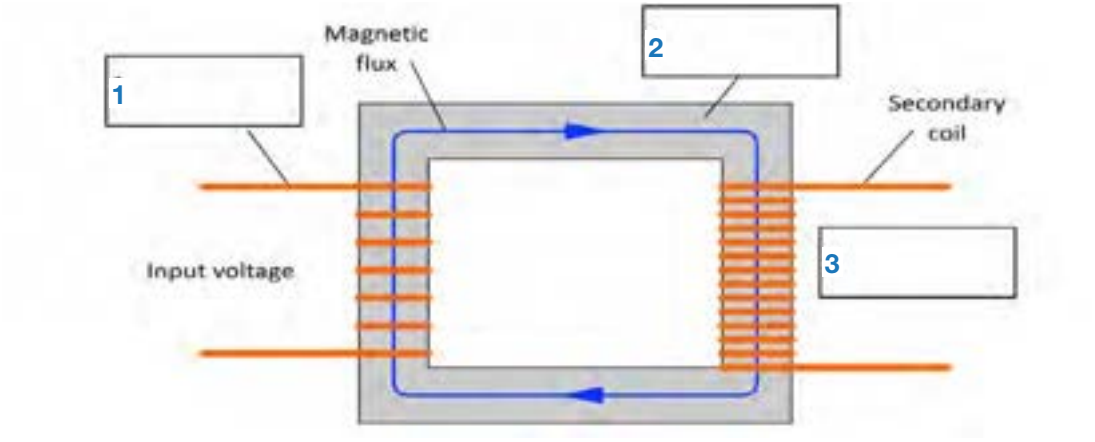
A Complete the paragraph about transformers with the given pieces of sentences.

decreasing the voltage
types of transformers
stationary devices
from one circuit to another

Transformers are the _____ **(1)** which are used for increasing or _____**(2)** of a current. These devices transmit energy _____ **(3)** via electromagnetic field. There are three _____ **(4)**: **step-up transformers**, **step-down transformers,** and **isolation transformers**.

B Write the missing information on the diagram showing the parts of a transformer.

iron core	output voltage	primary coil



ABBREVIATIONS

Write a word to complete the abbreviations about marine electric machines.

1 AC: Alternating _____
2 DC: _____ Current
3 Hz: _____
4 HP: _____
5 KW: _____

PROJECT Work in pairs. Search labels of motors and generators used on vessels today. Prepare a presentation about the information on the labels. Explain why the information is important.

7B AUTOMATION COMPONENTS

I. LEAD IN

Today, electronic circuits and automation systems are widely used on vessels. Automation system components can be classified in three main groups:

- Safety components
- Switches
- Sensors and actuators

Discuss the following questions with your classmates.

1 Do you know any automation system components in any of the groups mentioned above? What are they?

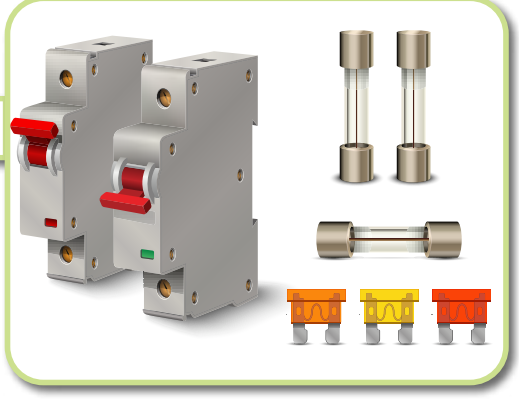
2 Do you think the automation systems are advantageous? Why/Why not?

II. READING AND VOCABULARY

A1 Work with your partner and match the photos with the safety components that are used on board.

1 Relays_____
2 Thermistors_____
3 Fuse/Circuit breakers_____
4 Phase relays_____

A



B



C



D



A2 Read and complete the sentences using the names of safety components.

- **Fuse/Circuit breakers**
- **Relays**
- **Phase failure relays**
- **Thermistors**

1 ***Relays*** protect the receivers in the circuit from overcurrent and high voltage by switching off the current when there is an abnormality.

2 _____ protect the circuit from high temperatures by monitoring the temperatures.

3 _____ protect the wiring from overcurrent by breaking the circuit when there is a problem.

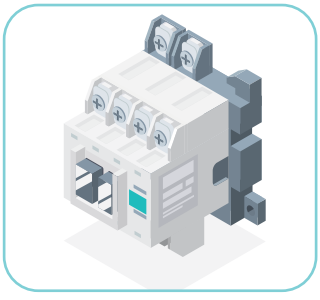
4 _____ protect the motor from being exposed to overcurrent and high voltage by monitoring the phase unbalance and uneven distribution of the load, and by shutting down the motor in three-phase electrical systems.

B1 Read the information in the boxes about switches and write the correct title for each of them.

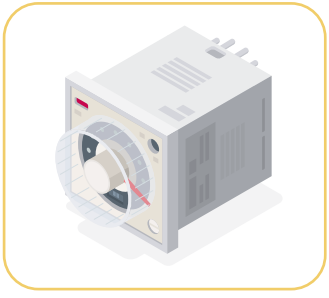
Contactors	Time Relays	Manually Operated Switches
A _____ They are hand-controlled switches with sets of electrical contacts connected to a circuit. These devices cut the current or let it flow through these contacts.	**B** _____ They are electrically controlled devices connected to contacts. These devices are used for switching the electrical circuit on and off by means of the current flowing in the coils.	**C** _____ They are the circuit elements that close the open contacts and open the closed ones at the end of the set time after the energizing or de-energizing of the mechanism on them.

7B AUTOMATION COMPONENTS

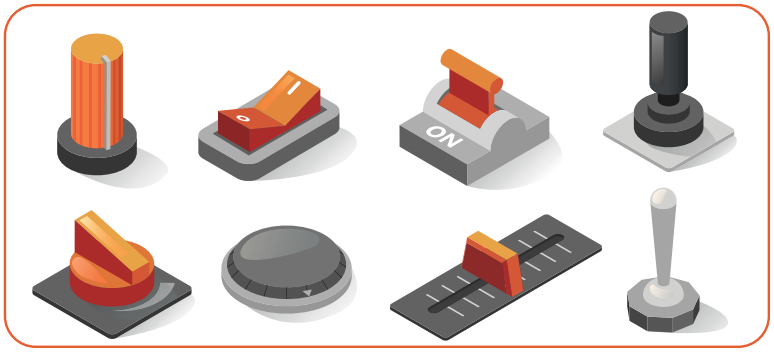
B2 Read the information in Exercise B1 on Page 217 again and write the names of the switches under their pictures below.



1 _____



2 _____



3 _____

III. WRITING AND SPEAKING

A1 Write the missing halves of the sentences about sensors and actuators in the automation circuit from the box to complete them meaningfully.

- there are various sensors
- from the sensors
- actuators are the last elements
- is processed in the control centre
- stimuli into electrical signals

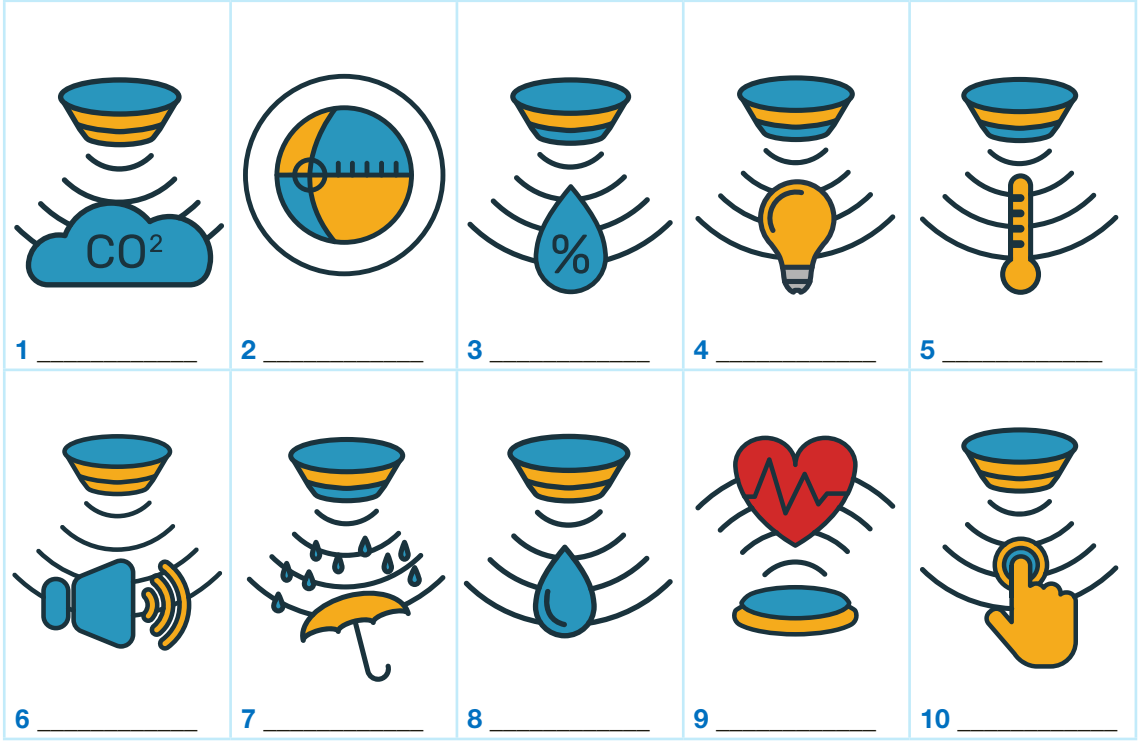
1 Sensors convert physical _____.
2 The converted signal _____.
3 _____ according to the area used and the need.
4 Actuators work with the information they receive _____.
5 _____ of an automation circuit.

A2 Read the sentences in Exercise A1 again and write the highlighted words in the boxes below.



B1 The icons on the table indicate sensor types. Write the correct sensor from the box under the icons.

rain	touch	light	gyroscope	humidity
gas	heartbeat	temperature	water	sound



1 _____ 2 _____ 3 _____ 4 _____ 5 _____

6 _____ 7 _____ 8 _____ 9 _____ 10 _____

B2 Ask and answer questions about the functions and importance of the sensors in Exercise B1 as in the example.

e.g., ***Student A:*** *What is a gas sensor used for on a ship?*

Student B: *It is used for measuring the gas content in a confined space.*

Student A: *Why is it important?*

Student B: *Because it is an important process to ensure occupational safety.*

PROJECT Visit a ship in groups and search what kind of automation components are used in it. Talk to the ETO or the concerned engineer of the ship, take photos or videos, prepare a presentation in detail.

MARINE ELECTRICS AND ELECTRONICS

7C ELECTRIC INSTALLATION AND ELECTRONIC CIRCUIT COMPONENTS

I. LEAD IN

Electrical installation materials used on ships should be durable and safe. Explosion-proof materials should be used in the environments containing explosive and flammable substances; and waterproof installation elements should be preferred in humid environments.

Discuss the following questions with your classmates.

1 Do you know any installation components used on ships? What are they?

2 What do you know about electronic circuit components?

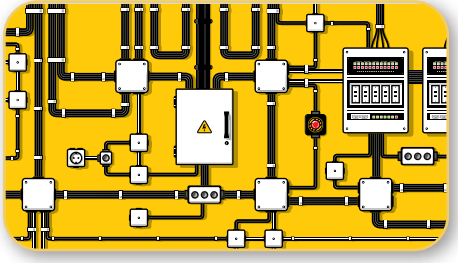
II. READING AND VOCABULARY

A1 Match the names of the basic electrical installation components with their photos.

Cables ___	**A Plug and a socket ___**	**Cable connection box ___**
Holders ___	**Buttons and switches ___**	**Cable cover ___**



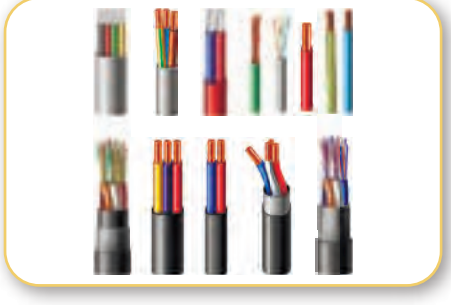
1 _____



2 _____



3 _____



4 _____



5 _____



6 _____

A2 Read the sentences about the electrical installation components and complete them with the names of these components from Exercise A1 on Page 220.

1 ***Buttons and switches*** are the elements used to control many receivers.

2 _____ are conductors which are used for electrical signal transmission. They are insulated against external effects on ships.

3 _____ are fixed canals used to prevent the cables from being exposed to external effects and to place them in an order.

4 A _____ is a joint where the cables are connected. It has covers which enable easy maintenance and repair.

5 A _____ is a tool which allows a device to be connected to and disconnected from the socket with the help of a cable.

6 A _____ is a tool that provides electrical energy to devices through a plug.

7 _____ are the sockets for connecting the lighting device to the electrical installation.

B Write the required forms of the words on the table below.

VERB	NOUN	ADJECTIVE
conduct	conduction	1 _____
2 _____	installation	installed
resist	3 _____	resistant
store	4 _____	stored
5 _____	amplification	amplified

7C ELECTRIC INSTALLATION AND ELECTRONIC CIRCUIT COMPONENTS

III. READING AND WRITING

A Read the sentences about electronic circuit components and write their names in the correct column on the table below according to their functions.

1 **Capacitors** are used for short-term storage of electrical charge, AC-DC conversion, filtering operations and preventing information loss.

2 **Resistors** limit the current allowing it to be conducted at a desired value, and maintain the flow of it at that value.

3 **Inductors** are used to store electrical energy as a magnetic field.

4 **Diodes** conduct electric current in one direction.

5 **Microchips** collect many circuit elements in a single core.

6 **Transistors** are semiconductive circuit elements which amplify low electrical signals and act as a switch in the circuit.

STORING ELECTRICAL ENERGY	CONDUCTING CURRENT

B Write what the following electric installation and electronic circuit components are used for with your own words.

1 Cable covers ___*protect cables from external effects*___.

2 Microchips _____.

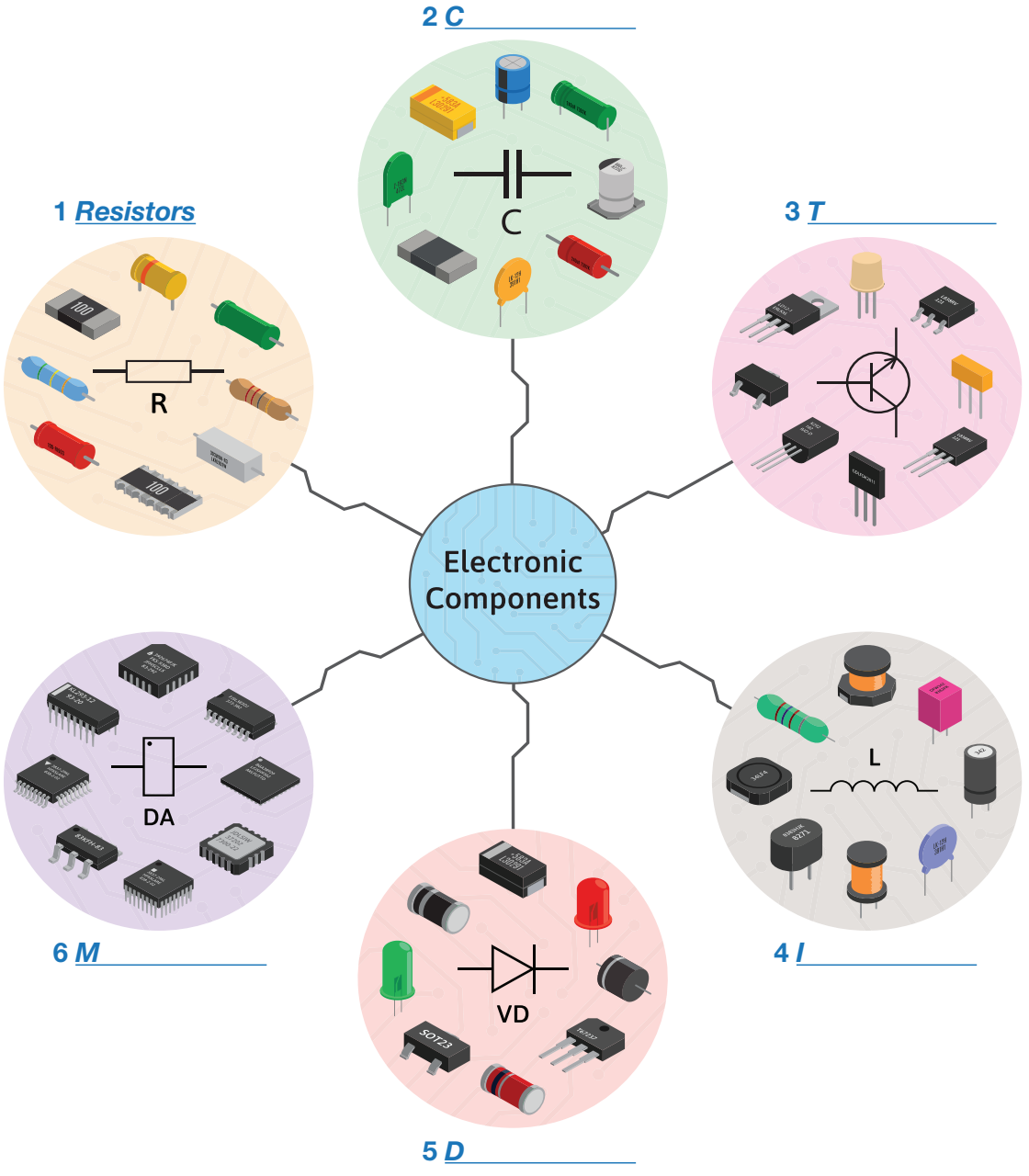
3 Cables_____.

4 Resistors_____.

5 Buttons and switches _____.

6 Inductors _____.

C Write the electronic circuit components that you have learned on the diagram.



PROJECT Choose an electric installation or electronic circuit component that is used on board and prepare a presentation about it. Give detailed information about the parts, working principle and function of it.

SELF ASSESSMENT 7	1	2	3
1 I can talk about working principles of an electric motor and a generator.			
2 I can tell the basic components of electric motors and generators.			
3 I can read the labels of electric motors.			
4 I can talk about the function of a transformer.			
5 I can recognise the automation components on a vessel.			
6 I can talk about how safety components and switches work briefly.			
7 I can tell what sensors and actuators are used for briefly.			
8 I can tell the basic electric installation components on a vessel.			

REVISION 7

1 The main function of _____ is to produce electrical energy for the systems on a vessel.

- **A** electric motors
- **B** generators
- **C** contactors
- **D** transformers

2 _____ convert electrical energy into mechanical energy used for various systems on board.

- **A** Thermistors
- **B** Generators
- **C** Contactors
- **D** Electric motors

3 AC and DC are the types of _____.

- **A** electric motors and generators
- **B** thermistors and relays
- **C** sensors and actuators
- **D** transformers and alternators

4 Which one is NOT written on an electric motor's label?

- **A** manufacturer
- **B** colour
- **C** voltage
- **D** type of the motor

5 Which one is NOT a component of an electric motor or a generator?

A brush

B rotor

C commutator

D holder

6 Step-up, step-down and isolation are the types of _____.

A switches

B thermistors

C transformers

D commutators

7 _____ are NOT among safety components.

A Relays

B Thermistors

C Contactors

D Circuit breakers

8 _____ protect cables from external effects.

A Holders

B Cable covers

C Plugs

D Cable connection boxes

9 _____ conduct electric current in one direction.

A Diodes

B Capacitors

C Resistors

D Inductors

10 _____ amplify low electrical signals.

A Microchips

B Inductors

C Transistors

D Capacitors

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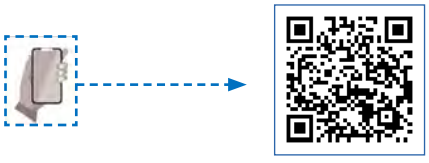
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