

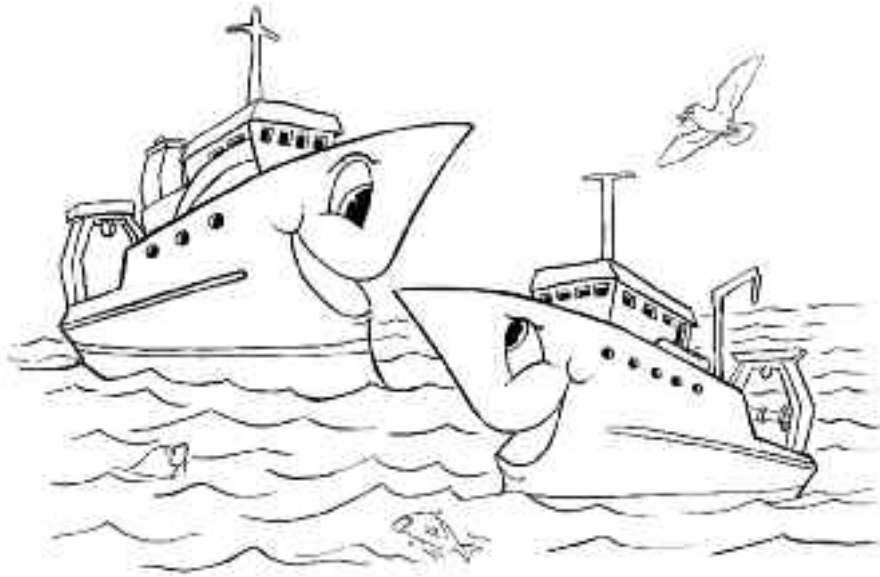
Illustrations by

*John Conway*



*Marine Institute*  
Foras na Mara

[www.marine.ie](http://www.marine.ie)



**THIS BOOK BELONGS TO:**

---

# EXPLORER'S NOTES



# FACTS ABOUT THE *RV CELTIC EXPLORER*

The Research Vessel *Celtic Explorer* is a multipurpose vessel designed for deep-sea research.

Find out Five Facts about the *RV Celtic Explorer*.

If you are visiting one of the research vessels, ask the crew for the answers, or look up the Marine Institute website: [www.marine.ie](http://www.marine.ie)

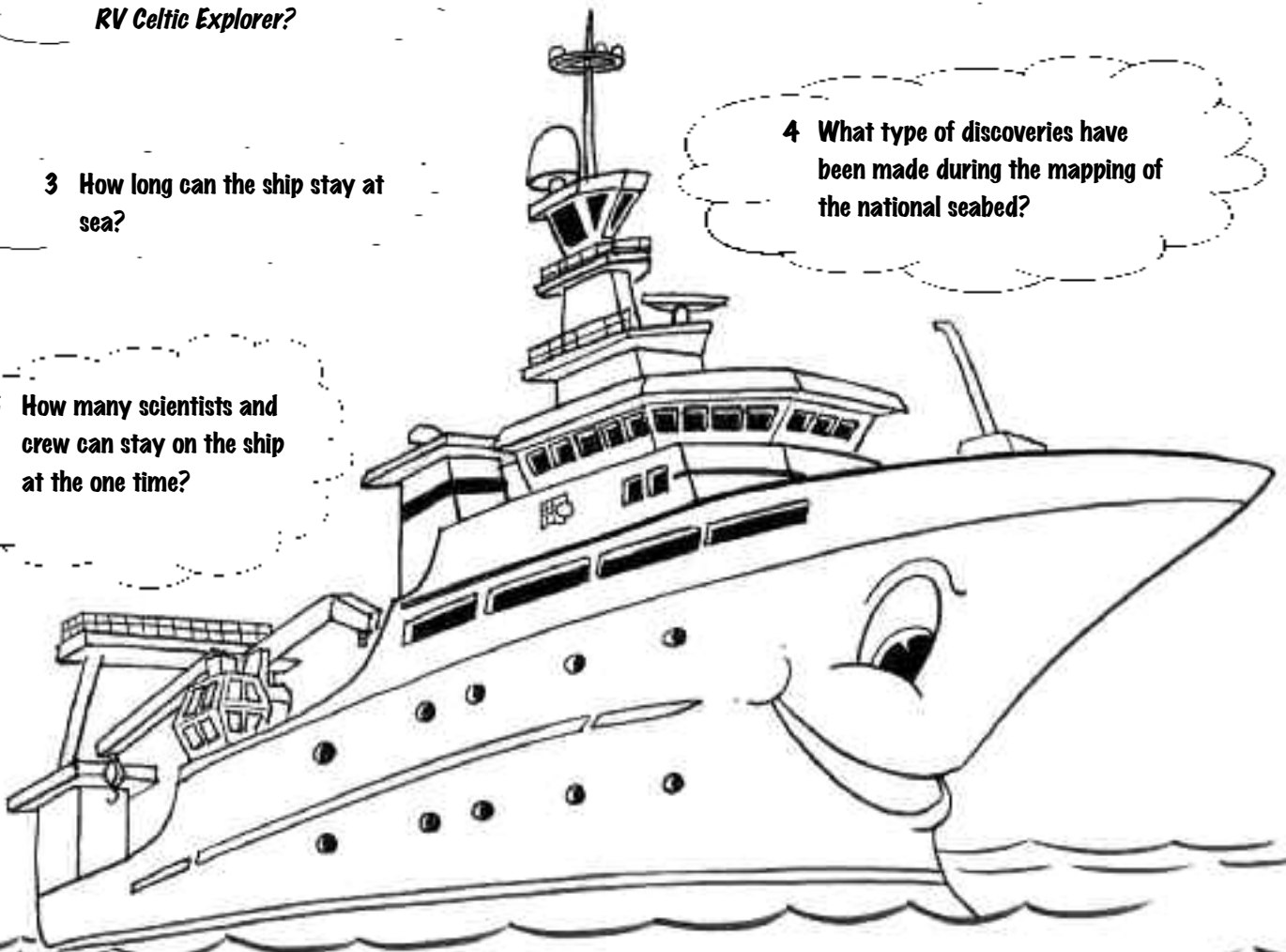
1 How long is the  
*RV Celtic Explorer*?

3 How long can the ship stay at  
sea?

5 How many scientists and  
crew can stay on the ship  
at the one time?

2 What speed does the  
*RV Celtic Explorer* travel at?

4 What type of discoveries have  
been made during the mapping of  
the national seabed?



***RV CELTIC EXPLORER SAYS...***



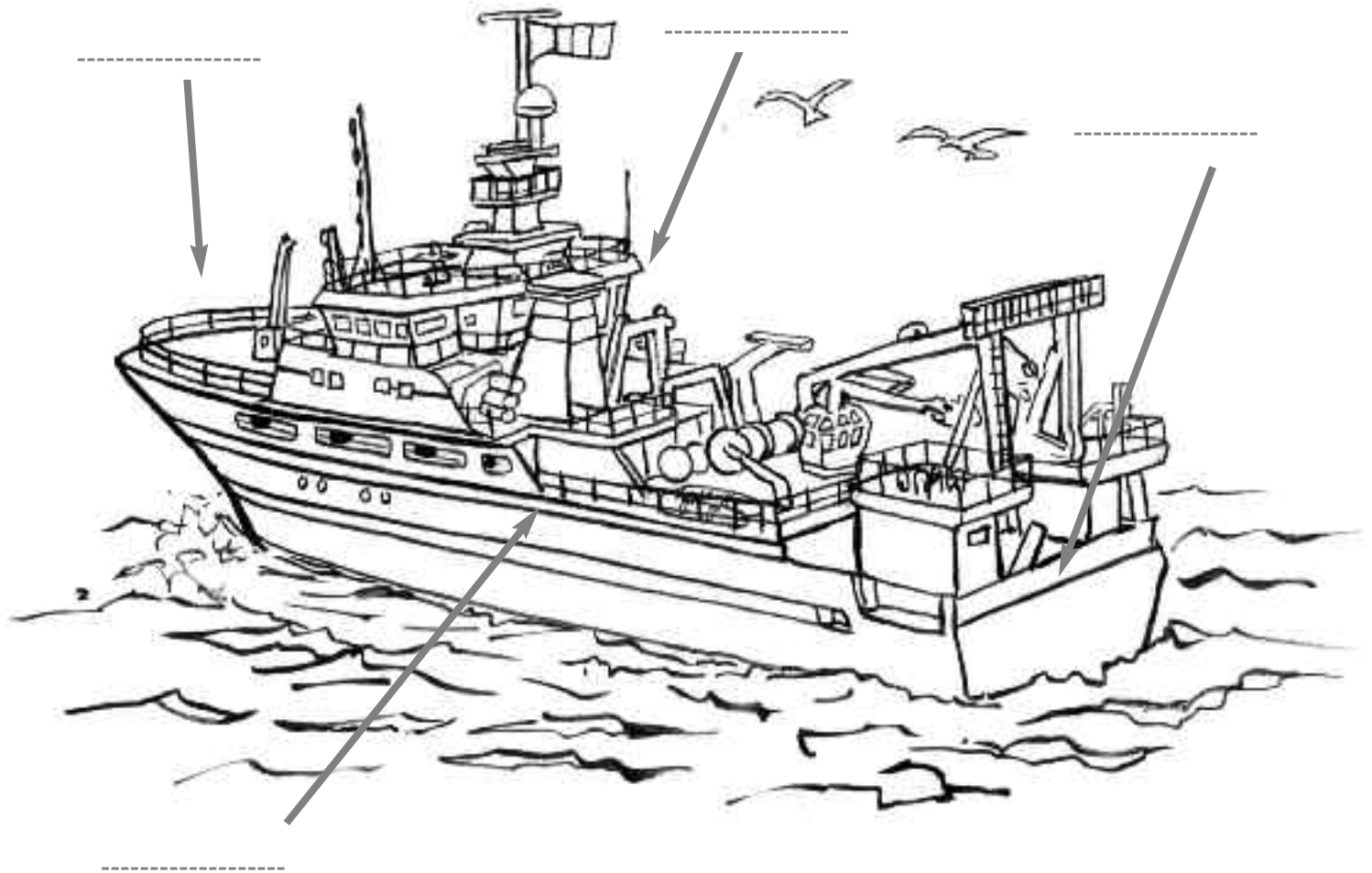
Check the Marine Institute website  
[www.marine.ie](http://www.marine.ie)  
for more facts about the  
*RV Celtic Explorer*.

# DO YOU KNOW YOUR LEFT FROM RIGHT... AND FRONT FROM BACK?

The crew on a vessel such as the *RV Celtic Explorer* need to know the special terms used for different locations when on board. The terms "port" and "starboard" are used, to define the left side and the right side of the vessel. The "bow" and "stern" are used to define the back and front of the vessel.

Can you fill in the spaces and name the different locations on the Vessel?

• Stern • Bow • Port • Starboard



**RV CELTIC EXPLORER SAYS...**



## SAFETY AT SEA

If you're going to the sea to swim or going out on a boat...  
Remember to tell someone on shore where you are going;  
who you're going with;  
and when you plan to be back.

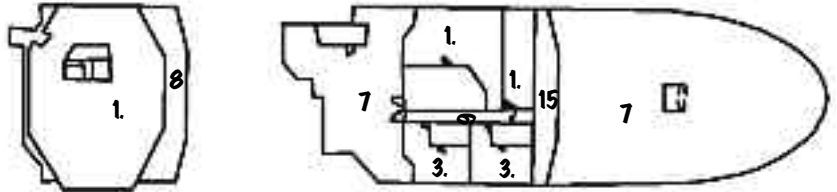
# THE RV CELTIC EXPLORER ... INSIDE

There are five levels on the *RV Celtic Explorer*, which include many different rooms such as cabins to sleep in, a hospital room for those that get sick, the mess for the crew to eat their meals and the bridge, where the captain of the ship directs the vessel's voyage. The laboratories are used for scientific research. The 'dry lab' is used for mapping and researching the seabed. The 'wet lab' is used to research marine life samples taken from the sea.

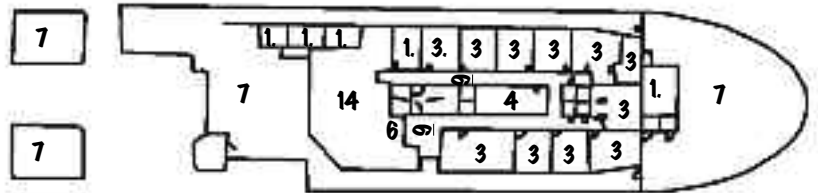
Find your way around the *RV Celtic Explorer*. Colour in the floor plans by the numbers and colour codes below.

- |     |            |  |                            |
|-----|------------|--|----------------------------|
| 1.  | Dark Green |  | Bridge / Technical Areas   |
| 2.  | Red        |  | Hospital                   |
| 3.  | Brown      |  | Cabin                      |
| 4.  | Orange     |  | Drop Keel                  |
| 5.  | Yellow     |  | Stores                     |
| 6.  | Sky Blue   |  | W.C / Changing Room        |
| 7.  | Light Gray |  | Deck                       |
| 8.  | Pink       |  | Wet Lab                    |
| 9.  | Purple     |  | Staircase / Companion ways |
| 10. | Lime Green |  | Lounge / Meeting Room      |
| 11. | Dark Gray  |  | Mess                       |
| 12. | Dark Blue  |  | Galley                     |
| 13. | Black      |  | Gym                        |
| 14. | Moave      |  | Dry Lab / Electronics Lab  |
| 15. | Cream      |  | Tanks                      |

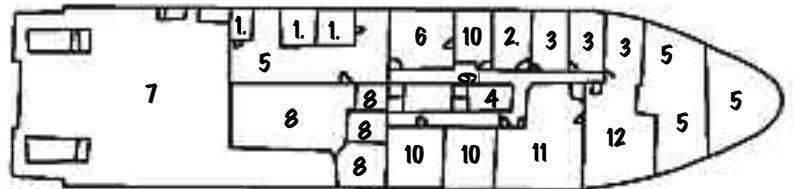
## Bridgedeck



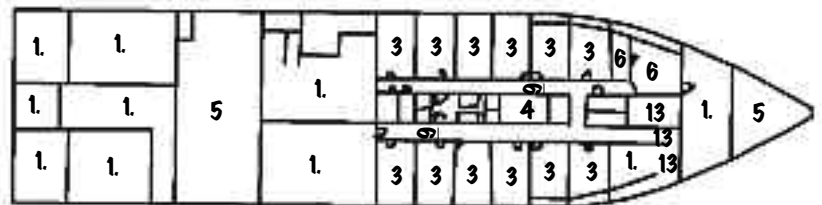
## Forecastle Deck



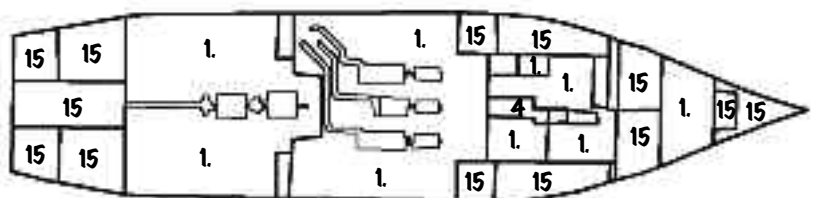
## Main Deck



## Lower Deck



## Below Lower Deck



## RV CELTIC EXPLORER SAYS...

**REMEMBER YOUR LIFEJACKET!**

If you are going out on a boat always wear a lifejacket.





# 220 MILLION ACRES UNDER THE SEA

Read all about mapping the seabed and its terrain. Then see if you can find the highlighted words amongst the jumbled letters in the box below...

**IRELAND** has an underwater **TERRITORY** of 220 **MILLION ACRES** under the sea, an area ten times that of its land. The **ADVANCED** Mapping Service Group at the **MARINE** Institute carries out **MAPPING** for the **NATIONAL** Seabed **SURVEY**. The **TEAM** of **EXPERTS** are involved with a number of **PROJECTS**, including **INFOMAR** and **MESH**. These projects involve **RESOURCE** mapping, **HABITAT** mapping and also developing large survey **DATA** sets.

Until recently, the only accurate **CHARTS** of Ireland's seabed dated back hundreds of years to the time of **CAPTAIN** William **BLIGH** of the H.M.S. **BOUNTY**. In those times a simple **WEIGHTED** rope with a lead weight on the end was lowered into the **WATER** until it reached the bottom. The rope was **KNOTTED** every 1.8 **METRES** (an old "fathom") to **CALCULATE** the **DEPTH** by counting the number of knots. Soft grease at the end of the lead **SINKER** was used to get samples of rock, **STONES** or **SAND** at the **BOTTOM** of the **SEABED**.

Nowadays **SCIENTISTS** measure depths using **SONAR** echo sounders called single beam and multi-beam echo **SOUNDERS**. Hundreds of **PINGS** or sound **WAVES** are **TRANSMITTED** through the water, and the scientists then measure how long the **ECHO** takes to **BOUNCE** back. **COMPUTERS** are used to calculate and **TRANSLATE** the information into **IMAGES**, which shows the seabed's **TERRAIN**.

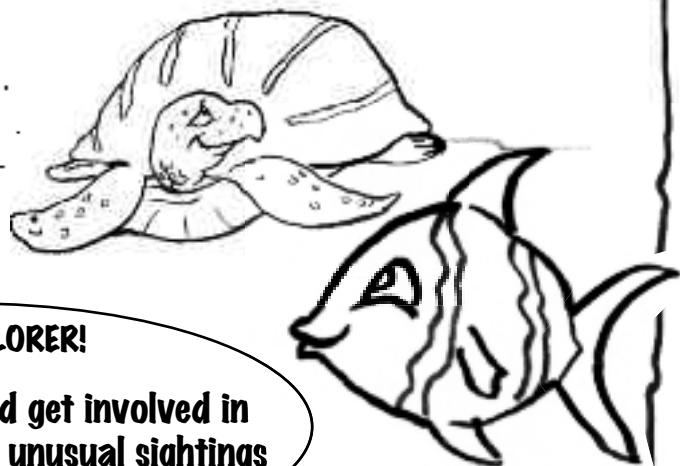


H	A	B	I	T	A	T	A	B	C	R	E	S	O	U	R	C	E	D	E	F	G	H	I	J	M	
K	A	M	I	L	L	I	O	N	B	T	R	A	N	S	L	A	T	E	C	D	E	F	G	C	A	
L	S	H	R	I	J	T	K	L	M	N	O	P	Q	T	R	S	D	T	P	I	N	G	S	A	E	
M	O	M	E	T	R	E	S	U	V	W	X	K	N	O	T	T	E	D	Y	Z	A	B	C	L	T	
N	U	D	L	E	F	R	G	H	I	J	K	L	M	N	O	P	P	Q	R	S	T	U	V	C	Q	
O	N	W	A	X	Y	R	Z	A	B	O	U	N	C	E	B	C	T	D	E	F	C	G	H	U	R	
P	D	I	N	S	C	I	E	N	T	I	S	T	S	S	J	K	H	L	M	N	O	P	Q	L	S	
M	E	R	D	O	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	M	I	J	A	T	
E	R	K	L	N	B	O	U	N	T	Y	N	M	N	L	O	P	Q	R	S	T	P	U	V	T	U	
S	S	W	X	A	O	R	Y	Z	A	B	A	C	R	E	S	C	D	E	M	F	U	W	G	E	V	
H	H	I	J	R	T	Y	K	L	M	N	T	O	P	A	U	Q	R	C	A	P	T	A	I	N	W	
Z	S	T	U	V	T	W	X	Y	Z	A	I	B	C	D	R	D	E	F	C	R	G	E	T	H	I	X
A	J	K	L	M	O	N	O	P	Q	R	O	P	E	R	V	S	T	U	I	V	R	E	W	X	Y	
B	Y	Z	A	B	M	C	D	E	F	G	N	H	I	J	E	C	K	L	N	M	S	R	N	O	D	
C	P	Q	R	S	B	T	U	V	G	W	A	V	E	S	Y	H	X	Y	E	Z	A	B	C	D	A	
D	E	F	G	H	L	I	J	K	R	L	L	M	C	N	M	A	P	P	I	N	G	O	P	Q	T	
E	R	S	W	E	I	G	H	T	E	D	T	U	H	V	W	R	X	Y	I	M	A	G	E	S	A	
F	Z	A	B	C	G	D	E	F	A	G	H	I	O	J	K	T	L	M	N	O	P	Q	R	S	E	
G	Y	U	V	W	H	X	Y	Z	S	A	N	D	A	B	C	S	I	N	K	E	R	D	E	F	N	
H	G	H	I	J	K	L	M	S	E	A	B	E	D	N	O	P	Q	T	E	R	R	A	I	N	I	
I	T	R	A	N	S	M	I	T	T	E	D	R	S	T	U	V	W	X	Y	Z	A	B	C	D	T	
J	I	J	A	D	V	A	N	C	E	D	K	L	M	N	O	P	Q	E	X	P	E	R	T	S	O	



**RV CELTIC EXPLORER SAYS...**

Did you know that nearly 3/4 of the world is covered in salty water.



**BE AN EXPLORER!**

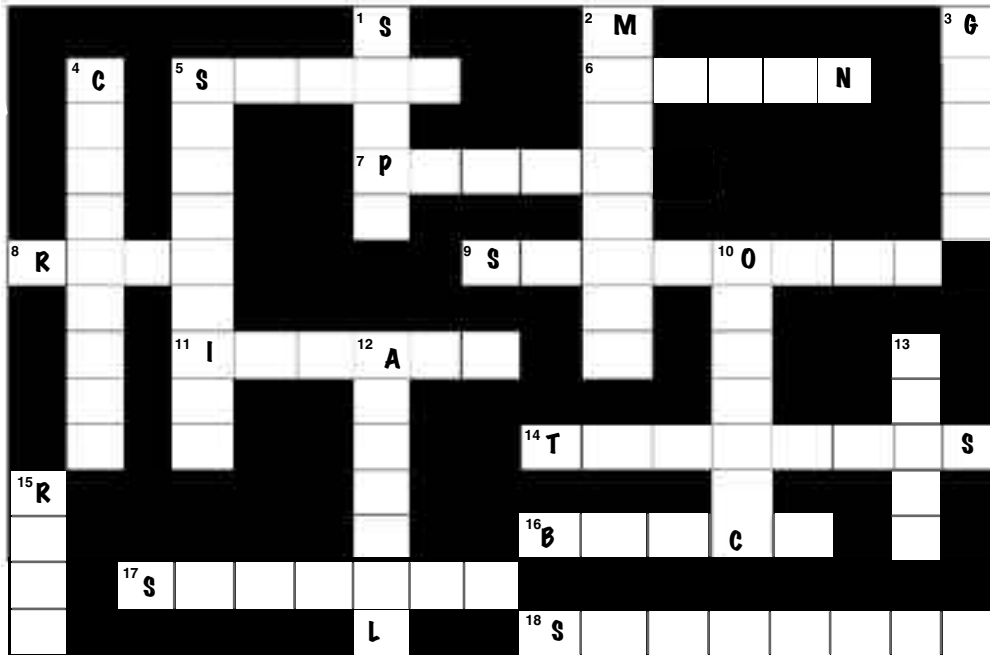
Start "exploring" and get involved in surveys or report any unusual sightings of marine life.





# UNDERWATER WORLD

The features of land under the ocean are very much like those found on land. There are mountains, slopes and plains. Study the diagram showing the different features found under the sea. Then see if you can work out the clues to complete the crossword.

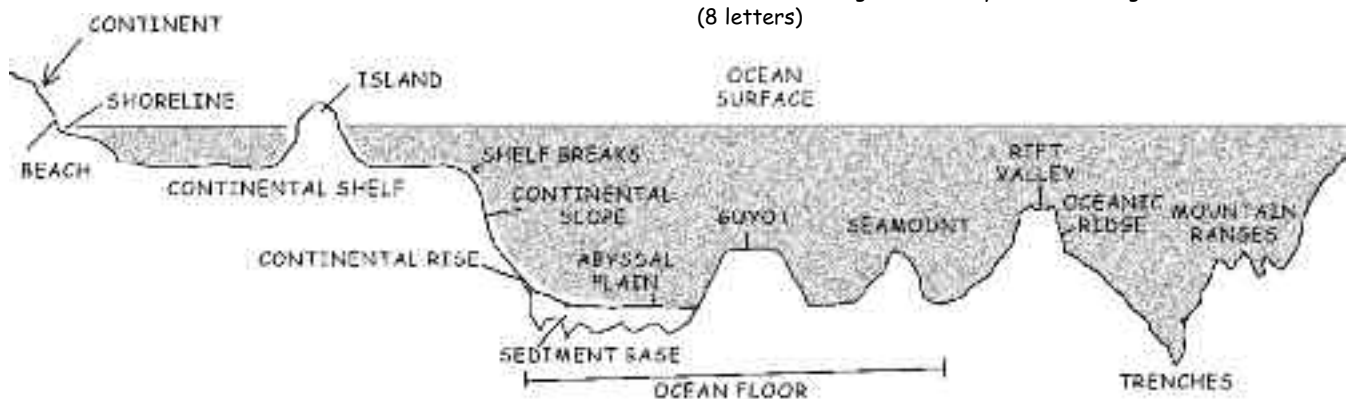


## Down

1. The Continental S \_ \_ \_ \_ is the steep area at the outer edge of the Continental shelf. (5 letters)
2. Think of areas of the landscape that are higher than hills and are all connected together. Under the sea they have them as well and are known as M \_ \_ \_ \_ \_ Ranges. (8 Letters)
3. A G \_ \_ \_ \_ is a seamount that has a flat top. (5 letters)
4. The European C \_ \_ \_ \_ \_ is bordered by the Arctic Ocean. (9 letters)
5. The S \_ \_ \_ \_ \_ between the land and sea. You will often pick shells up from around this area. (9 letters)
10. The Mountain ranges under the water from each of the world's oceans connect up forming the longest mountain range on earth. It is called the O \_ \_ \_ \_ \_ Ridge. (7 letters)
12. The A \_ \_ \_ \_ \_ Plains is the deepest, darkest and coldest area of the ocean. (7 letters)
13. This point is where the Continental shelf drops off suddenly to form the Continental slope and is known as a shelf B \_ \_ \_ \_ . (5 letters)
15. Oceanic ridges have two pronounced peaks, separated by a prominent depression known as a R \_ \_ \_ valley. (4 letters)

## Across

5. The Continental S \_ \_ \_ \_ starts at the shore line edge and continues under the sea as a shallow sea-floor. You might also find one in a cupboard. (5 letters)
6. The \_ \_ \_ \_ N floor is at the bottom of the sea. (5 letters)
7. An area of flat land at the bottom of the ocean is called the Abyssal P \_ \_ \_ \_ . (5 letters)
8. The bottom area of the Continental slope that ascends above the Abyss is known as the Continental R \_ \_ \_ . (4 letters)
9. A single mountain under the sea is called a S \_ \_ \_ \_ \_ . (8 letters)
11. An area of land not connected to the Continent and is surrounded by water is called an I \_ \_ \_ \_ \_ . (6 letters)
14. A series of V shaped, deep valleys found adjacent and parallel to continents and island chains are called T \_ \_ \_ \_ \_ . (8 letters)
16. This area is an expanse of sand or pebbles along the seashore. We also like to go to the B \_ \_ \_ \_ on a hot summers day. (5 letters)
17. This is at the top of the ocean. Fishermen may find seaweed floating on the Ocean S \_ \_ \_ \_ \_ . (7 letters)
18. The S \_ \_ \_ \_ \_ base is where the remains of marine life drift down filling in the rocky floor creating smooth surfaces. (8 letters)



# STORM IT OUT WITH THE BUOYS

The Irish marine weather buoy network consists of six weather buoys around the coast of Ireland. They are used to give information on forecasting the weather. They can measure wind speed and direction, humidity and give storm warnings. The weather buoy's also can measure the height of waves and it's swell period. The weather forecast is important for people on shore and also those involved in marine activities such as fishermen fishing, and even surfers surfing. The *RV Celtic Explorer* helps to maintain the Buoys.

**Play "Storm it Out" with your friends!!!**

**Use bottle caps to represent your ship and take turns in rolling a dice to move across the board.**

**If you reach a weather buoy - you'll get extra moves ... if you land on a 'storm' - anything could happen.... Good luck!**

<b>Finish</b> □	99	98	97	96	95	94 94. Reached a Buoy ...Move ahead two spaces	93	92	91
81	82. Storm Warning - Strong winds ahead.. <b>HEAD BACK TO 64</b>	83	84	85. Perfect weather <b>HAVE ANOTHER GO</b>	86	87	88	89	90
80	79	78	77	76	75	74	73	72	71 71. Reached a Buoy ...Move ahead three spaces
61	62	63	64	65	66	36. Storm Warning - Large swells. <b>MISS A GO</b>	58	69	70
60	59. Reached a Buoy ...Move ahead five spaces	58	57	56	55	54	53	52	51
41	42	43	44	45	46	47	48	49	50 50. Reached a Buoy ...Move ahead three spaces
40	39	38	37	36. Storm Warning - Hit by Lightning ahead - <b>GO BACK TO 26</b>	35	34	33	32	31
21	22	23	24	25	26	27	28	29	30
20. Reached a Buoy ...Move ahead one space	19	18	17	16	15	14	13. Storm Warning - Rain ahead. <b>Go back 2 spaces</b>	12	11
<b>Start</b> →	2	3. Reached a Buoy ...Move ahead four spaces	4	5	6 Dropped litter overboard - <b>GO BACK TO START</b>	7	8	9	10



# CURRENTS AND TIDES

Did you know that there is also A-tug-of-War pulling at the water in the Ocean?

Read about what causes currents and tides... then see if you can find the highlighted words amongst the jumbled letters in the box below. Check carefully because some of the words are spelt backwards.

The earth's **GRAVITY** pulls at the ocean towards the **PLANETS** core and at the same time the **MOON** pulls the ocean away from the **EARTH**. This is what causes high **TIDES** and low tides. **OCEAN** Currents, which are like **RIVERS**, move through the **SEA**. **SURFACE** currents are caused by the **WIND**. **DEEPWATER** currents **FLOW** more **SLOWLY** and form when extra **COLD**, saltier water **SINKS** and pushes less **SALTY** water out of the way. **CURRENTS** also move in all directions and can be affected by the **SHAPE** of the ocean **FLOOR**. The **MOVEMENT** of tides can also cause currents when it moves towards and away from the **LAND**.

F	A	E	A	R	T	H	B	C	D	L	D
L	E	C	S	H	A	P	E	S	E	A	E
O	M	U	E	F	L	O	W	R	F	N	E
O	O	R	G	H	I	P	J	E	K	D	P
R	O	R	L	C	O	L	D	V	M	N	W
O	N	E	P	G	R	A	V	I	T	Y	A
W	I	N	D	Q	R	N	S	R	T	T	T
U	V	T	W	O	C	E	A	N	X	L	E
Y	Z	S	E	D	I	T	A	B	C	A	R
E	C	A	F	R	U	S	I	N	K	S	D
S	L	O	W	L	Y	E	F	G	H	I	J
K	L	M	N	M	O	V	E	M	E	N	T

**RV CELTIC EXPLORER SAYS...**



## WAVES

Did you know that a wave is energy that moves the water in the ocean. It moves in a circular motion, up and forward, then down and back. When a wave reaches the shore it is shallower. This forces the top of the wave to join closer together until they tumble over forming breakers. Next time you're near the sea watch how it moves...

## SWIM SAFELY !

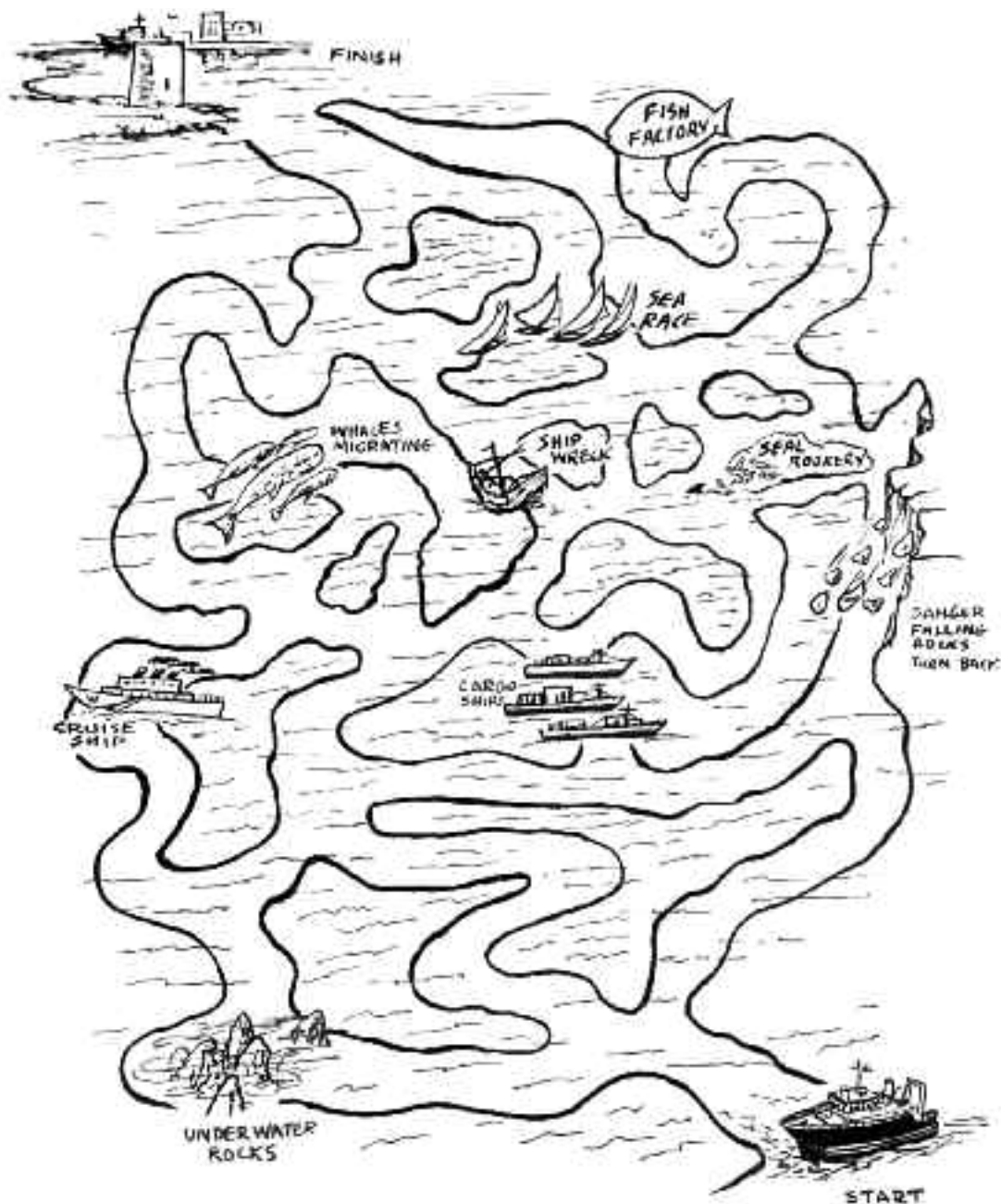
When Swimming in the sea, always be careful of waves and currents that can pull you out to sea and also watch the changing tides that can leave you stranded on rocks.

# FOLLOW THE VESSELS

The Marine Institute operates two research vessel's which travel around Ireland's coast and also as far out as Rockall Trough, the Porcupine Bank and the deepest waters exceeding 4000m. The *RV Celtic Explorer* has also ventured into the Arctic Circle and as far away as Norway.

The scientists on board, research and collect important information about marine life and the ocean, chart maps of the seabed, collect environmental data, and investigate ocean currents and the world's weather.

**During the research vessels travels the crew and scientists encounter many adventures...  
Try cruising through the maze below to get to the Galway port without getting blocked  
off or ending up at the Fish Factory.**

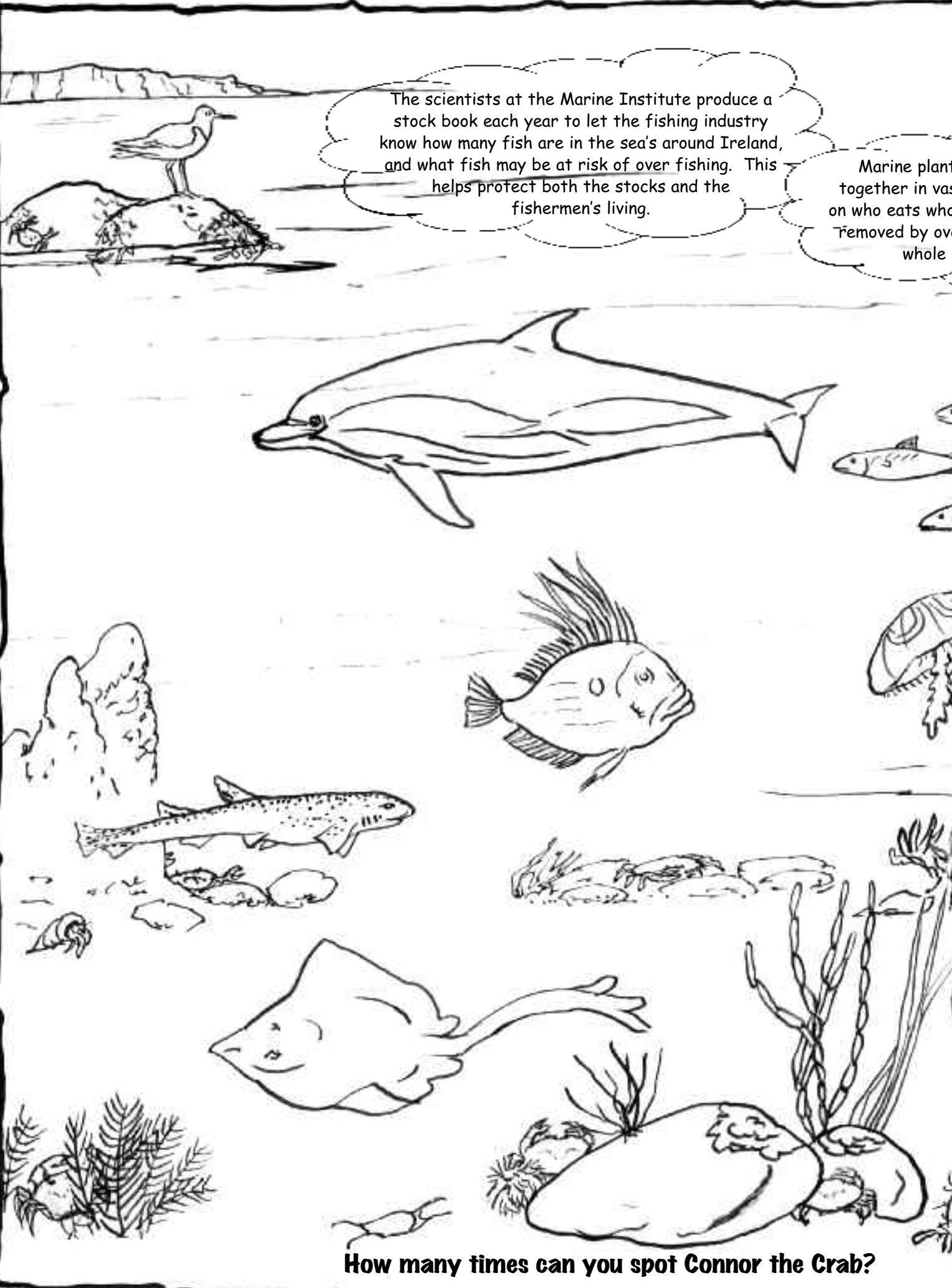


## RV CELTIC EXPLORER SAYS...



Look up the Marine Institute website [www.marine.ie](http://www.marine.ie) to discover what trip the research vessels are on and what research activities they are currently involved with.

You could also ask your school teacher to sign onto [www.followthefleet.ie](http://www.followthefleet.ie) to see a live map of where the research vessels are currently located as well as commercial ships trading from port to port around the world.



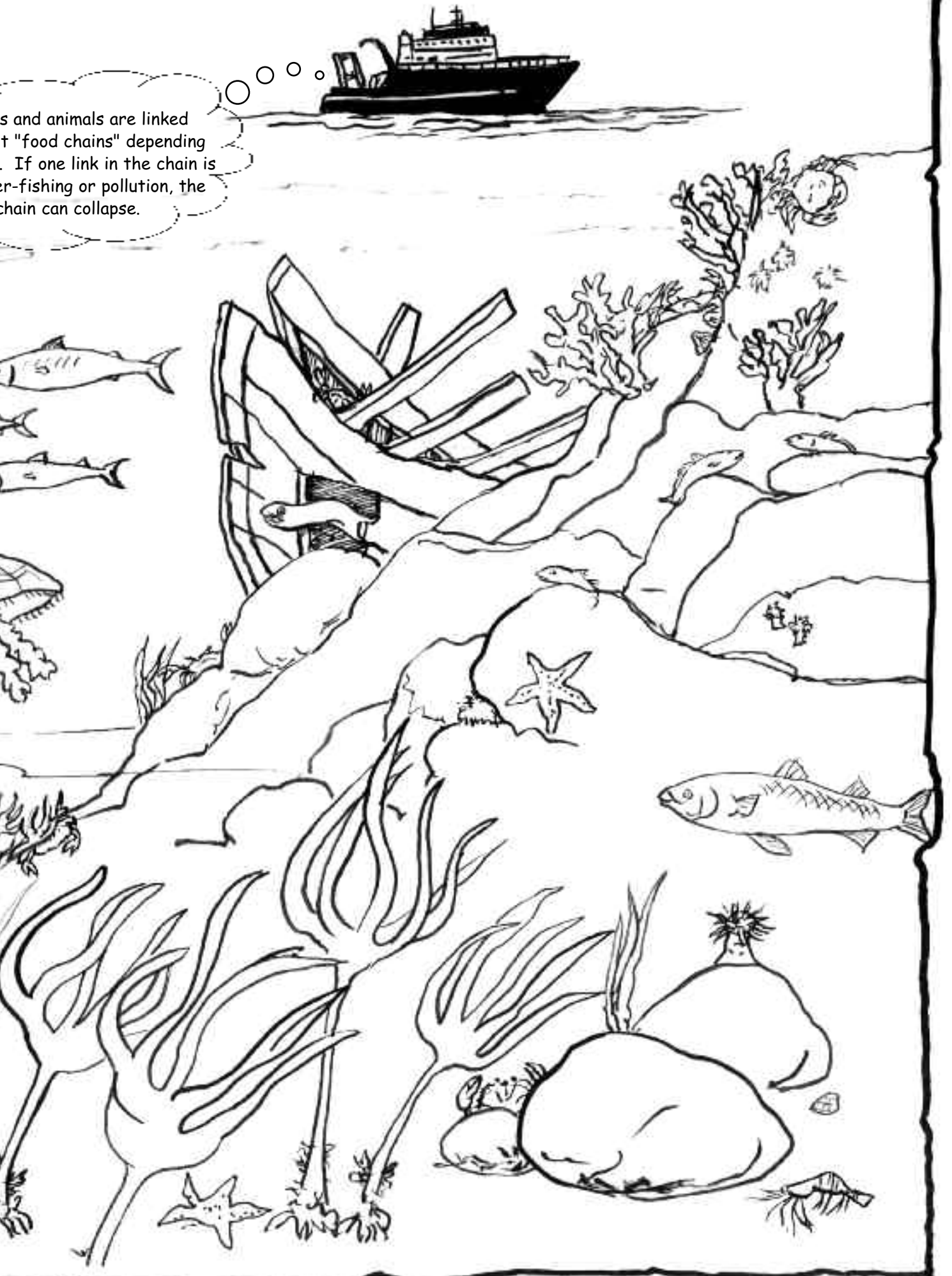
The scientists at the Marine Institute produce a stock book each year to let the fishing industry know how many fish are in the sea's around Ireland, and what fish may be at risk of over fishing. This helps protect both the stocks and the fishermen's living.

Marine plants together in vast areas on who eats who. Removed by overfishing whole communities.

**How many times can you spot Connor the Crab?**

# THE CHAIN OF LIFE

Plants and animals are linked together in "food chains" depending on their needs. If one link in the chain is broken by over-fishing or pollution, the whole chain can collapse.



# FACTS ABOUT *RV CELTIC VOYAGER*

The *Celtic Voyager* research vessel is used mainly for inshore marine science research.  
Find out Five Facts about the *RV Celtic Voyager*...

If you are visiting one of the research vessels, ask the crew for the answers, or look up the Marine Institute website: [www.marine.ie](http://www.marine.ie)

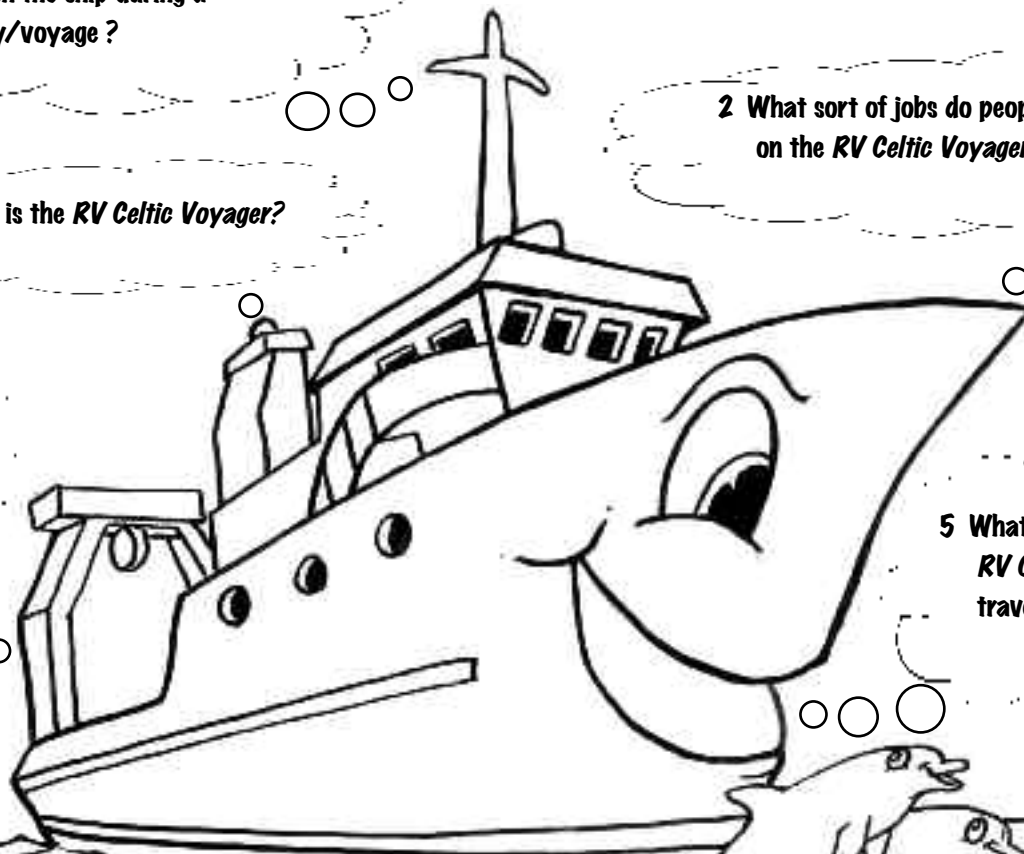
1 How many scientists and crew can stay on the ship during a survey/voyage?

2 What sort of jobs do people have on the *RV Celtic Voyager*?

3 How long is the *RV Celtic Voyager*?

4 How long can the ship stay at sea?

5 What speed does the *RV Celtic Voyager* travel at?



***RV CELTIC VOYAGER SAYS...***

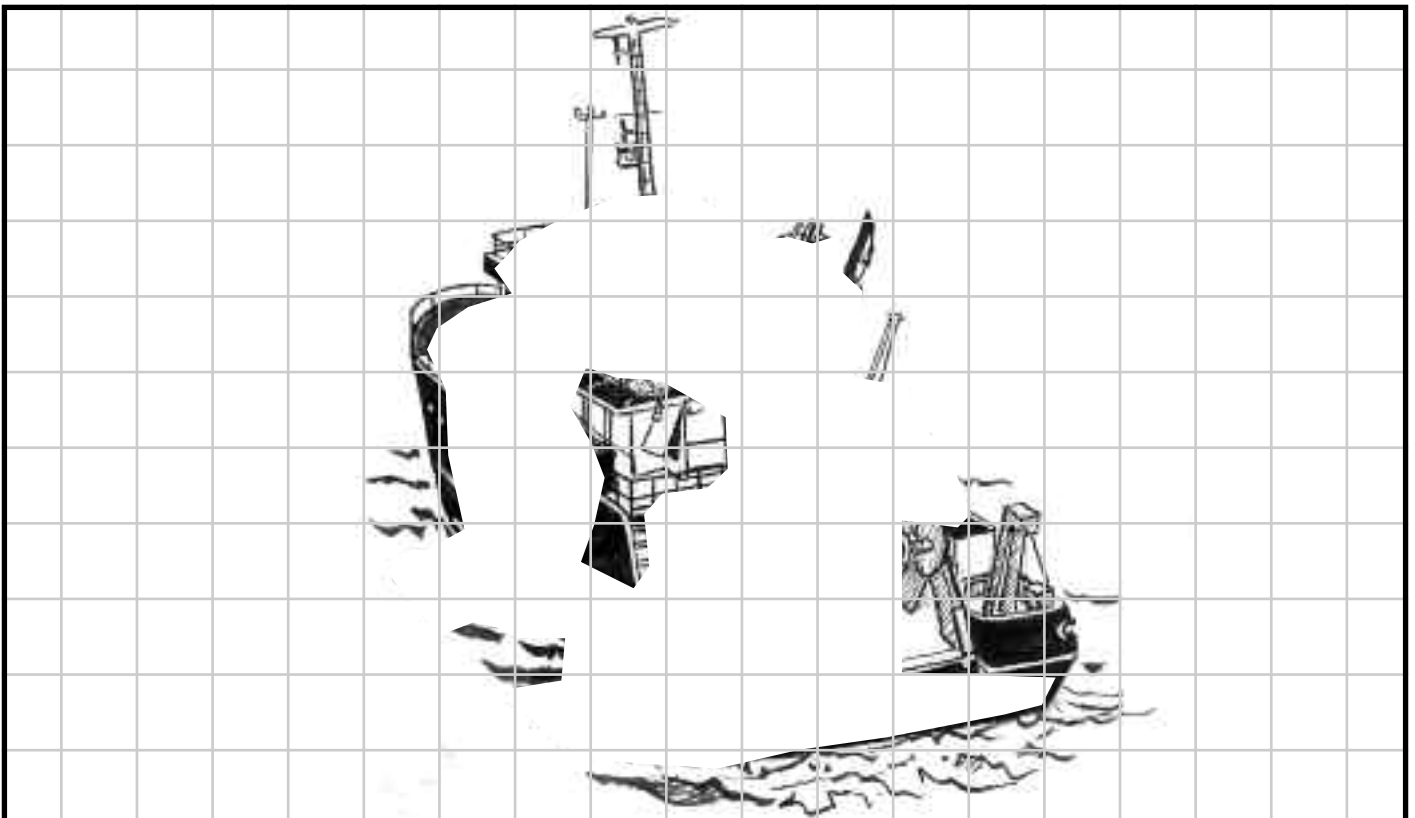
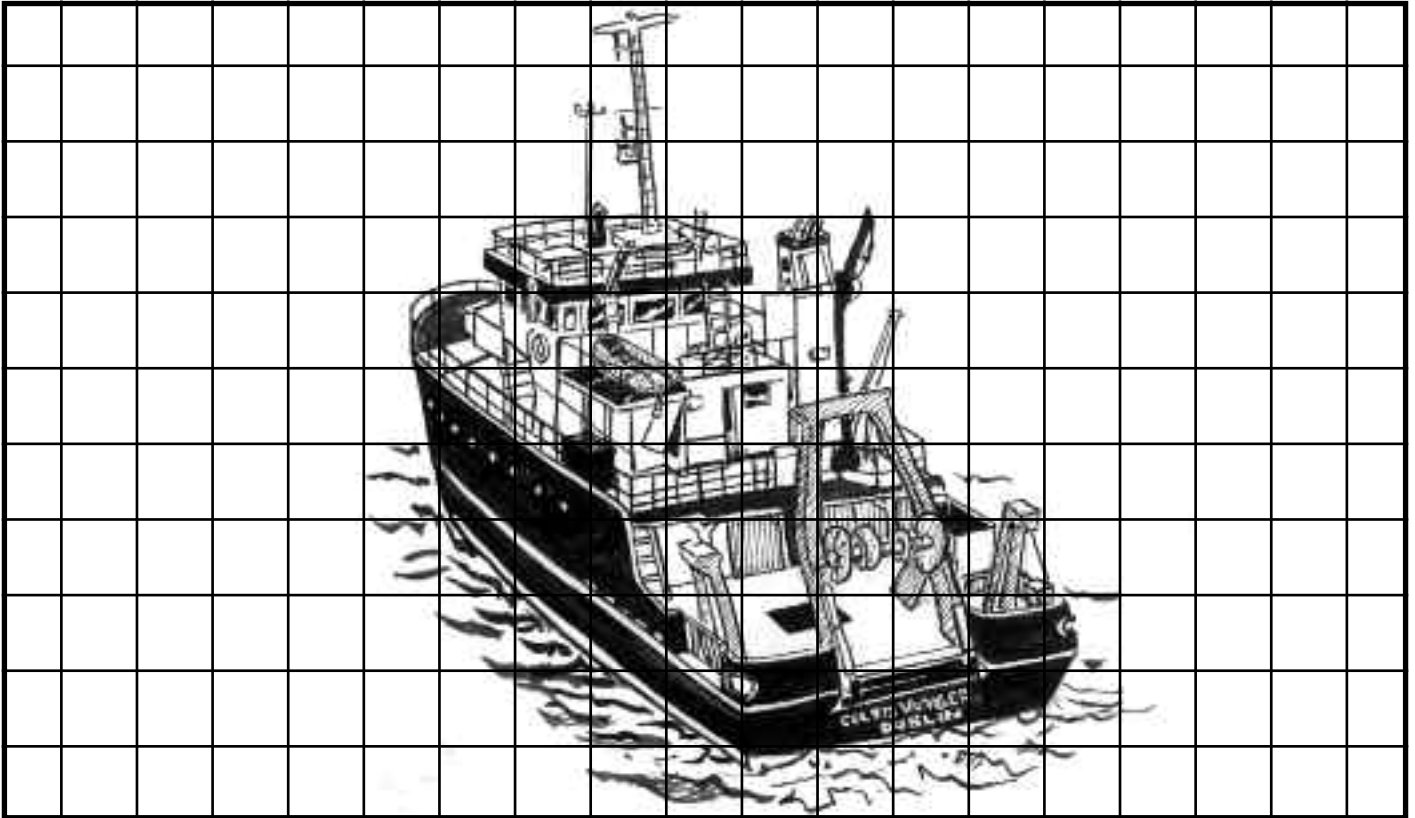
Check the Marine Institute website  
[www.marine.ie](http://www.marine.ie)  
for more facts about the  
*RV Celtic Voyager*.



# DRAW THE *RV CELTIC VOYAGER*

The *RV Celtic Voyager* is a research vessel that works mainly on inshore marine research projects. This would include studying everything to do with the ocean, such as marine biology, marine geology and also marine chemistry.

Try drawing the *RV Celtic Voyager* by using the grid pattern. Copy each box at a time, and then colour the vessel in.



# ZONE IN ON THE MARINE ENVIRONMENT

Scientists divide the sea into three levels depending on the depth to which light can reach. Can you work out which description matches the zones below. Draw a line to match them up.

1 This zone stretches to the darkest and deepest part of the ocean. It has the coolest temperatures and has less animals living there. The animals grow slowly and feed off the dead organisms that float down.

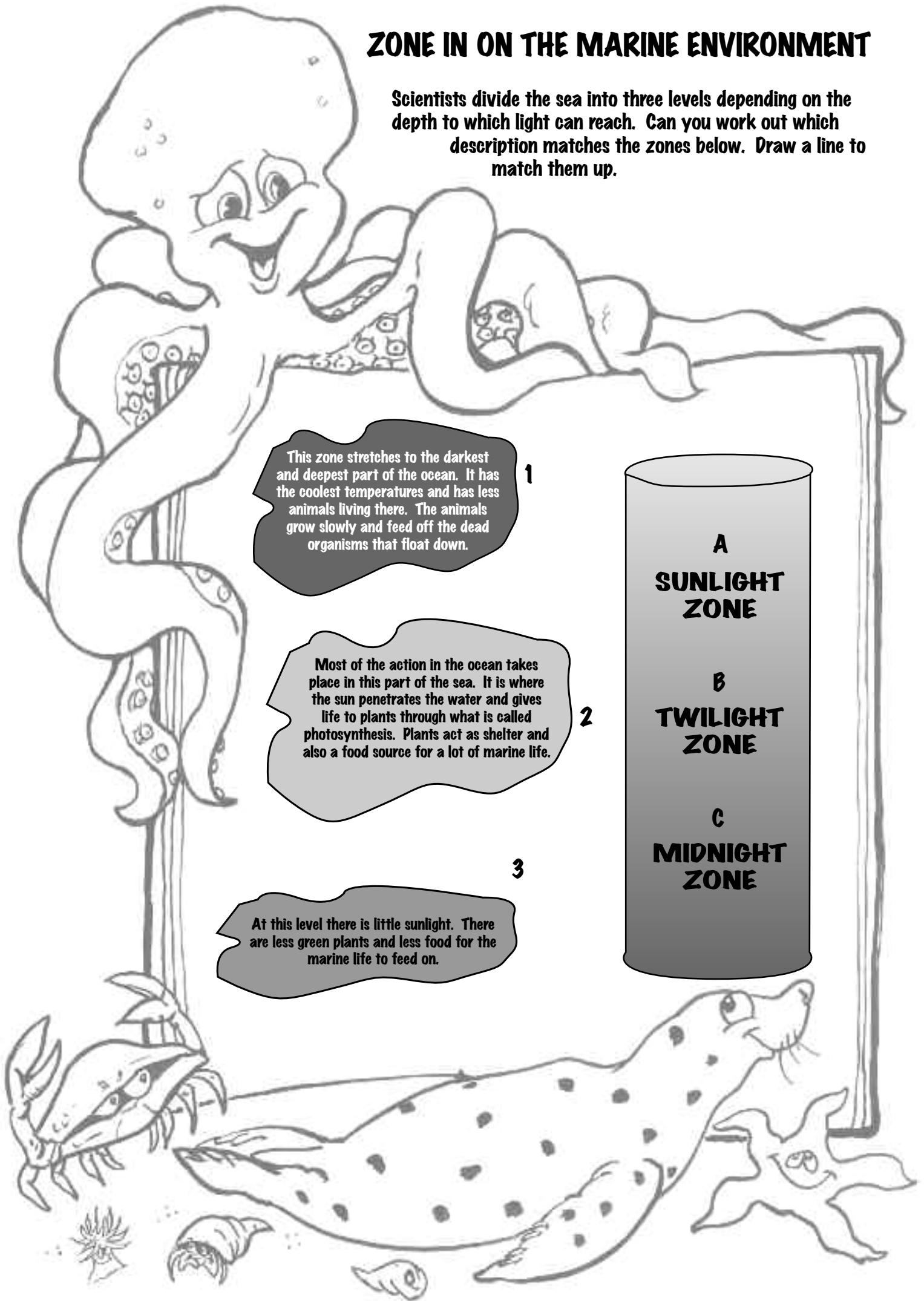
2 Most of the action in the ocean takes place in this part of the sea. It is where the sun penetrates the water and gives life to plants through what is called photosynthesis. Plants act as shelter and also a food source for a lot of marine life.

3 At this level there is little sunlight. There are less green plants and less food for the marine life to feed on.

A  
SUNLIGHT  
ZONE

B  
TWILIGHT  
ZONE

C  
MIDNIGHT  
ZONE



# THE FISH FAMILY

Scientists give names to different marine life, according to what part of the ocean they live and how they move about.

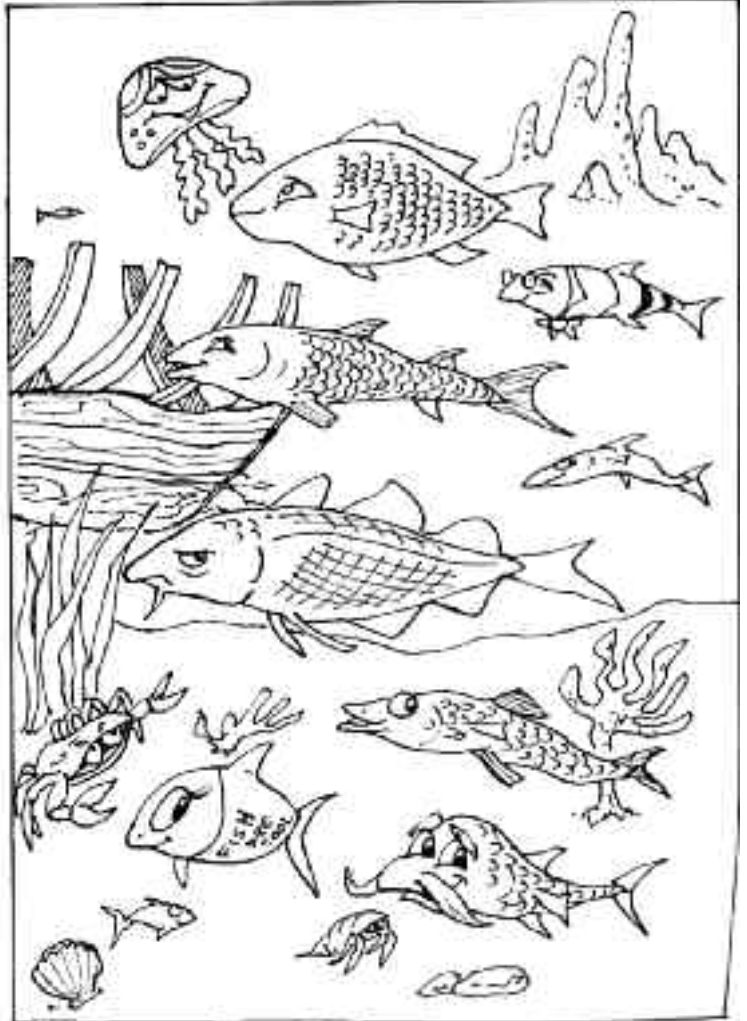
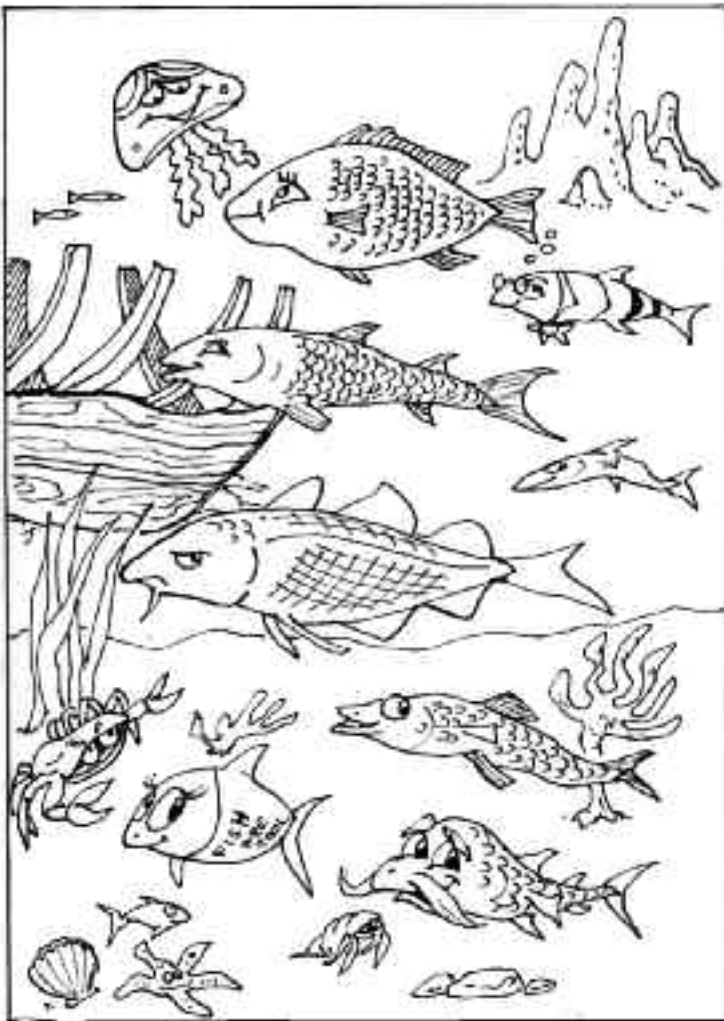
**Plankton** are small microscopic organisms that live near the top of the ocean's surface, and drift with the tides and currents.

**Nekton** is an organism that swims in the ocean. They can be the smallest fish or the largest whale.

**Benthos** is the name given to creatures that live on or in the seabed, such as starfish, snails, shellfish and crabs.

Scientists at the Marine Institute study, research and advise the fishing industry and the Government about where animals and plants in the sea live, how many there are, and how fast they are growing.

Have some fun and spot the differences in the pictures of the family of fish below...



## DON'T BE GREEDY!

Think of how many shells you need before taking them home. Empty shells are also part of the ecosystem and are often used by smaller animals to live in. When fishing, only take home what you need and don't forget to release the young fish when caught.

**RV CELTIC VOYAGER SAYS...**

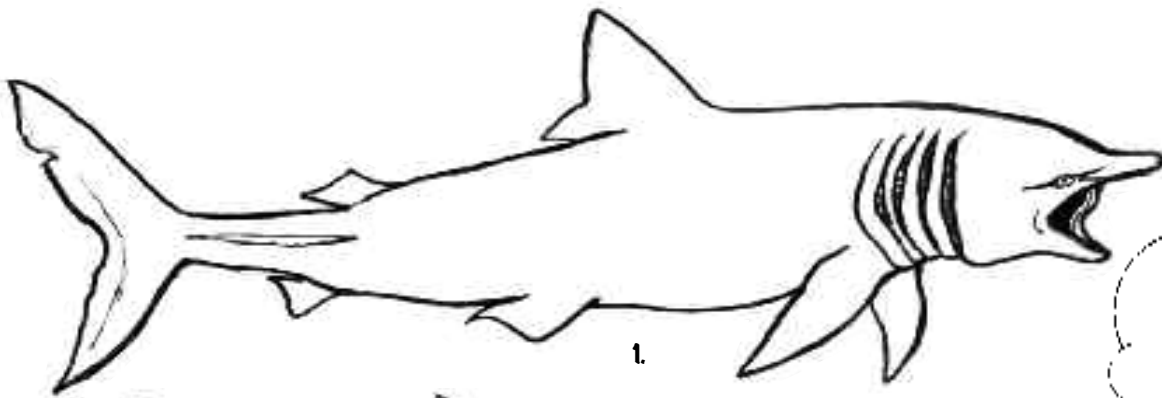


Do you know how many types of plankton there are in the Sea?

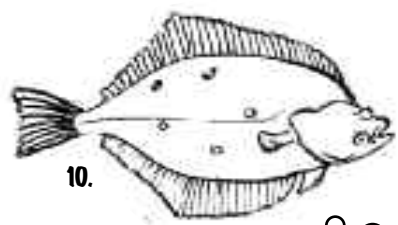
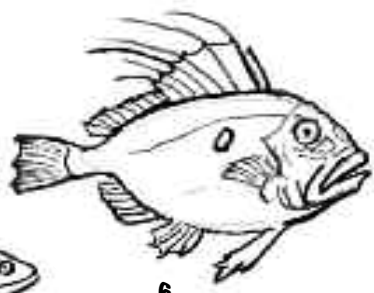
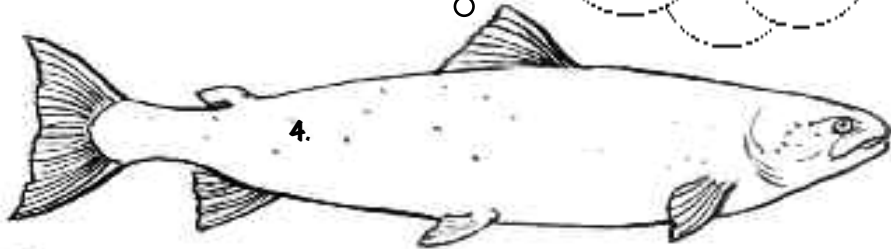
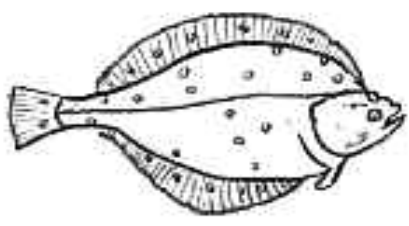
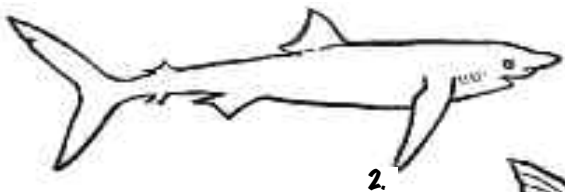
# MOVERS AND SHAKERS

Marine life in the ocean comes in all shapes and sizes, and move in different ways. Some marine animals are carried from place to place by the currents or can attach themselves to larger marine life to transport themselves around. Most fish have fins to move themselves through the water.

Can you name the different species of Irish fish below? Also see if you can point out the fin names as well...



The **Pectoral and Pelvic Fins** are found at either side of the fish's body, and are used for steering and balancing. The fish hold them close to the body to move faster and flap them out to act like brakes.

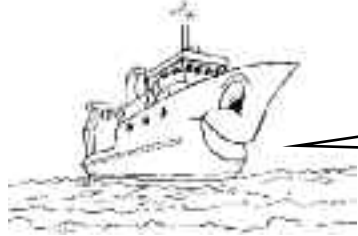


The **Dorsal Fin** at the top of the fish and the **Anal Fin** at the bottom of the fish, help to stop the fish rocking from side to side.

The **Caudal Fin**, or tail moves side to side to move the fish through the water.



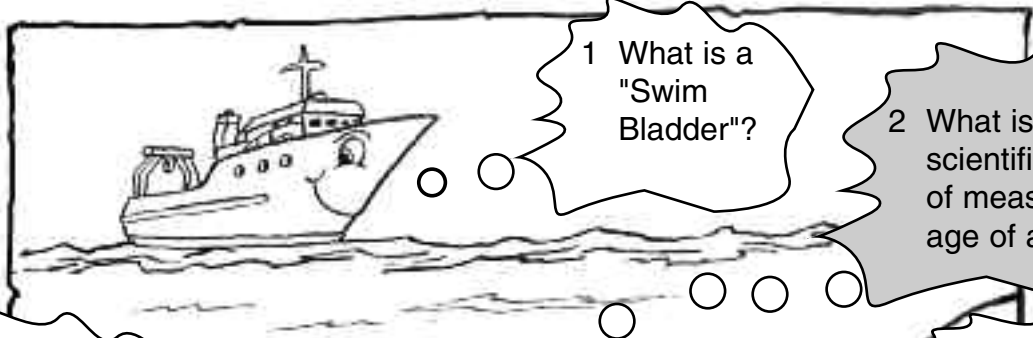
**RV CELTIC VOYAGER SAYS...**



**DON'T BE A BIG BAD GIANT!**  
A lot of Marine animals are smaller than you and are very delicate. If you're exploring rock pools remember to be gentle, observe and leave their homes as you found them.

# FACTS ABOUT FISH

Here are some more interesting facts to find out about fish ... have a quiz with your friends and family to see who can come up with the most answers....



1 What is a "Swim Bladder"?

2 What is the scientific method of measuring the age of a fish

12 Which is the largest type of fish?

3 Can sharks float?

11 Which is the biggest crab in the world?

4 Which Seahorse (male or female) gives birth to baby Seahorses?

10 Which fish is so shocking that it could light up a light bulb?

5 What is a Mermaids Purse?

9 What type of jewels grow under the sea, and where do they grow?

6 What type of fish lives in both the fresh water and the ocean?



8 What do Whales and Dolphins use to see?

7 Which fish have headlights?

**RV CELTIC VOYAGER SAYS...**



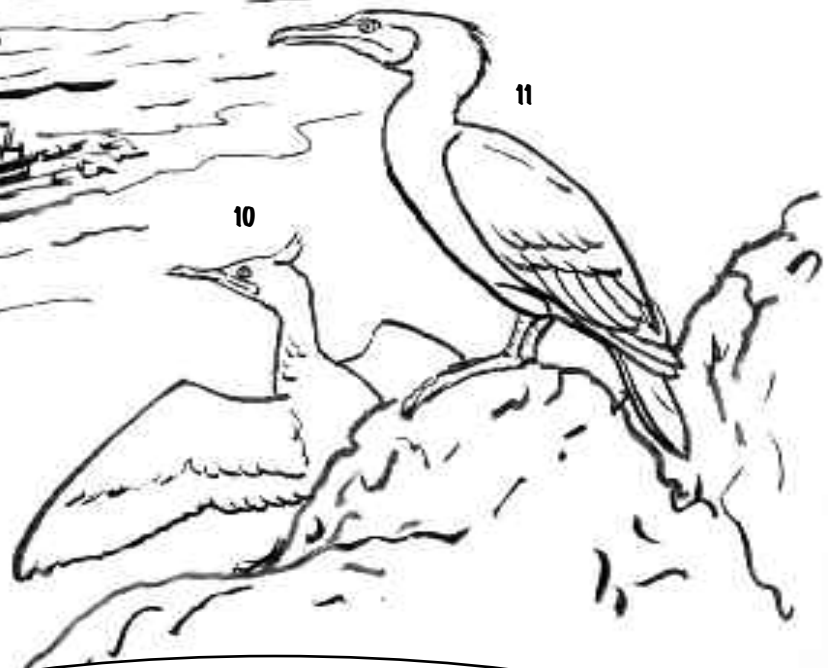
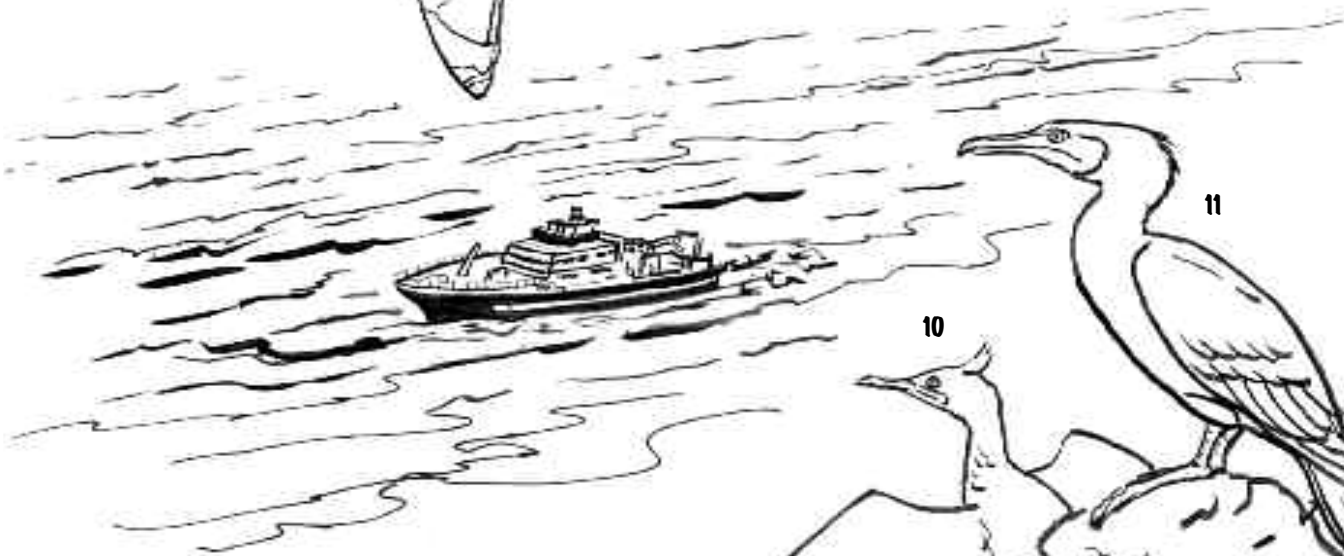
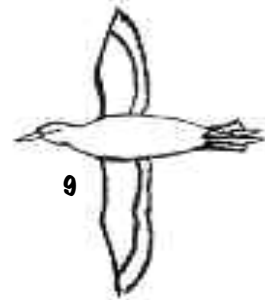
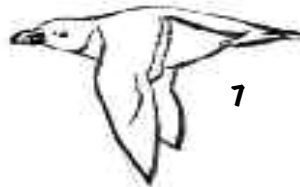
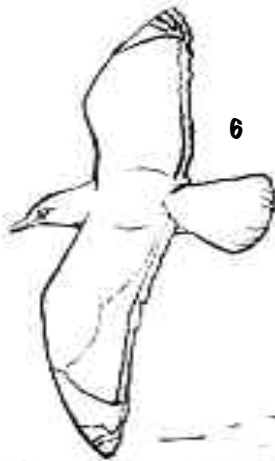
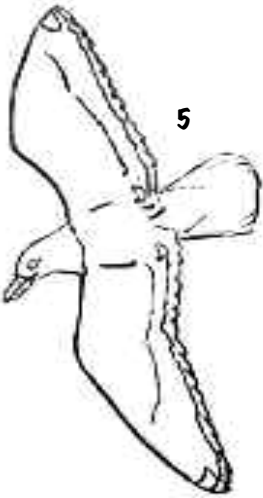
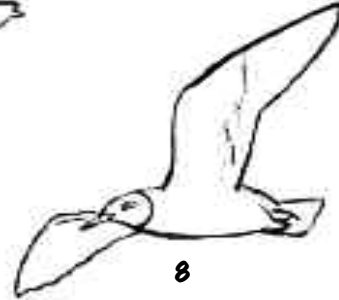
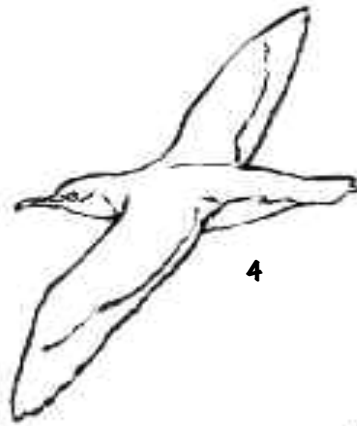
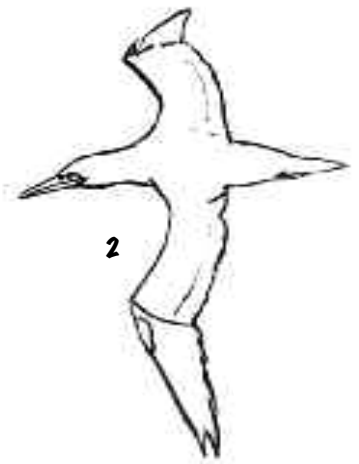
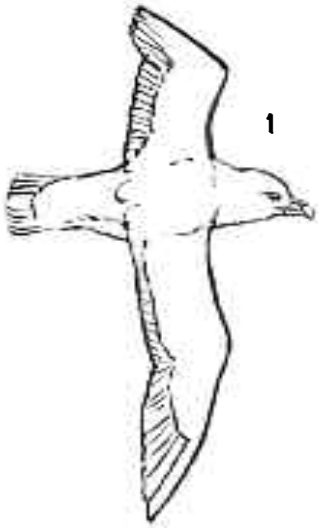
## LIVE AND LET LIVE

Marine animals don't live in the same environment as we do. If you take them away from their home they will not survive.

# MARINE BIRD LIFE

The marine ecosystem also consists of birdlife.

Can you name the Irish seabirds below?



**RV CELTIC VOYAGER SAYS...**



## REUSE & RECYCLE

Ask your friends, family and school teacher's to get involved in conservation projects to help protect the environment. This could include recycling bottles, plastic and paper. Can you think of other ways to reduce rubbish at home and at school ?

# BE THE SOLUTION TO POLLUTION

The Ocean is full of wonderful marine life, which can be put at risk by pollution.

Pollution can include rubbish from our home. Plastic bags and plastic six-pack rings for holding drink cans, can be swallowed by animals or strangle them by getting tangled around their bodies. Nuclear waste, chemical fertilizers from farms and oil spills all make their way into the ocean and can poison the marine life and the environment they live in. People can also get sick if they eat fish that has been affected by pollution.

Scientists who work in the Marine Institute test and monitor seafood products in Ireland to make sure it is safe to eat. They also check the coastal waters to make sure they are safe from pollution.

**Spot the difference in the pictures of the scientist working below...**



**RV CELTIC VOYAGER SAYS...**



**SAVE THE SEA**

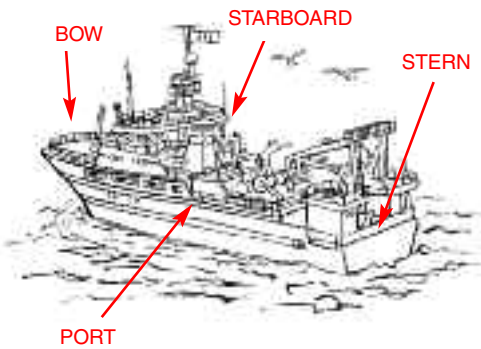
You can help save the sea by doing small things at home and at the beach. Cut up 6-pack plastic ring holders. If the rubbish bins at the beach are full take home your rubbish. Pick up and dispose of rubbish that has been washed up from the sea.

# Answers

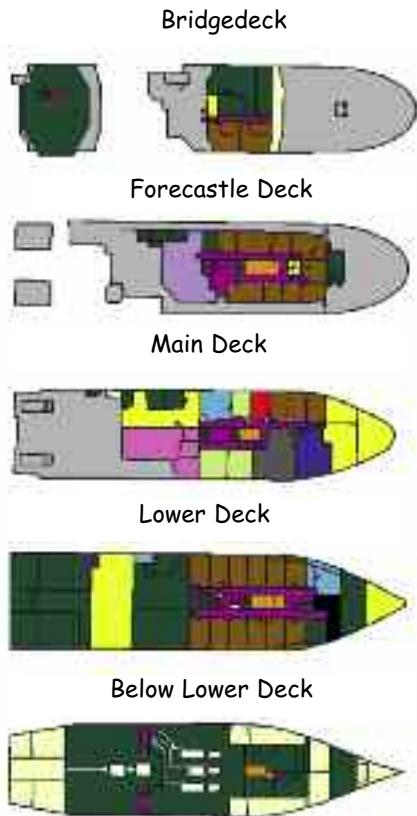
## Facts about the RV Celtic Explorer

- 65.5metres
- >/=14 knots
- 45 days
- Coldwater rare coral, hidden deposits of frozen gas, giant canyons and shipwrecks
- 12 crew and 19 scientists can stay on the ship

## Do you know your left from your right...?

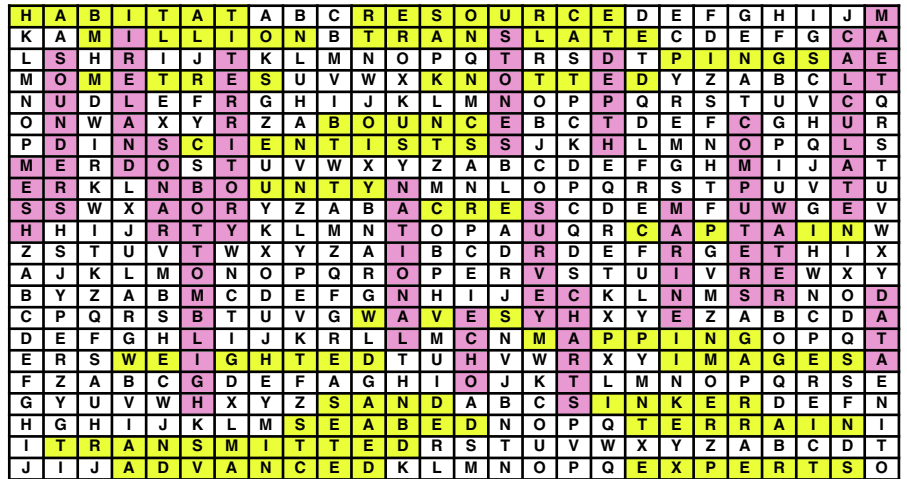


## The RV Celtic Explorer ... Inside



- Bridge / Technical Areas
- Hospital
- Cabin
- Drop Keel
- Stores
- W.C / Changing Room
- Deck
- Wet Lab
- Staircase / Companion ways
- Lounge / Meeting Room
- Mess
- Galley
- Gym
- Dry Lab / Electronics Lab
- Tanks

## 220 Million Acres under the Sea - Find the Words



## Underwater World - Crossword

### DOWN

- Slope
- Mountain
- Guyot
- Continent
- Shoreline
- Oceanic
- Abyssal
- Break
- Rift

### Across

- Shelf
- Ocean
- Plain
- Rise
- Seamount
- Island
- Trenches
- Beach
- Surface
- Sediment

## Currents and Tides - Find the Words



## Follow the Vessels - Maze



# Answers

## Facts about the *RV Celtic Voyager*

- 8 scientists and 6 crew can stay on the ship.
- There are those who run the vessel which include the Captain, Engineers, Technicians, Seamen and the Chef. The Vessel is also used by Scientists and Researchers who study Marine Life and the Ocean, such as Marine Biologists, Chemists, Fisheries Scientists, Geologists and Oceanographers.
- 31.4 metres
- 17 days
- >/= 10 knots

## Zone in on the Marine Environment

- C = 1  
A = 2  
B = 3

## The Fish Family - Spot the difference

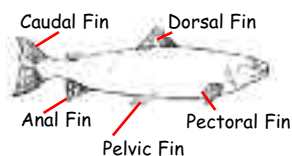


## The Fish Family - *RV Celtic Explorer* Says...

There are three types of plankton in the sea  
• Crustaceans • Algae  
• Dinoflagellates

## Movers & Shakers - Name the Fish & Fin Names

- Basking Shark
- Blue Shark
- Plaice
- Salmon
- Pollack
- John Dory
- Cod
- Whiting
- Sandeel
- Flounder



## Facts about Fish

- A Swim Bladder is an air filled sac inside the fish's body. When a fish breathes in the air, the swim bladder is filled with air and helps the fish to float. When the bladder deflates, the fish will sink.
- Counting the annual rings (annuli) on the otolith, which is found at the base of the fish's skull is the scientific way to measure the age of the fish.
- Sharks don't have bladders therefore they have to swim continuously so they don't sink.
- Male seahorse give birth to baby seahorses.
- Mermaid's purses are egg cases containing the live babies of dogfish.
- Salmon.
- The Angler fish has a long fin dangling in front of its face with which glows at the end to attract smaller fish into its mouth.
- They use their ears for sound waves - not their eyes, to find their way around the ocean.
- In warm tropical waters, pearls can be found growing inside shells of oysters and clams.
- Different types of fish can give electric shocks to protect themselves or catch their dinner. The torpedo ray shock is so strong it could light a light bulb.
- The spider crab which can be found in Japan can measure up to 4 metres long.
- The Whale Shark - which is as heavy as six elephants and as long as six people joined head to toe.

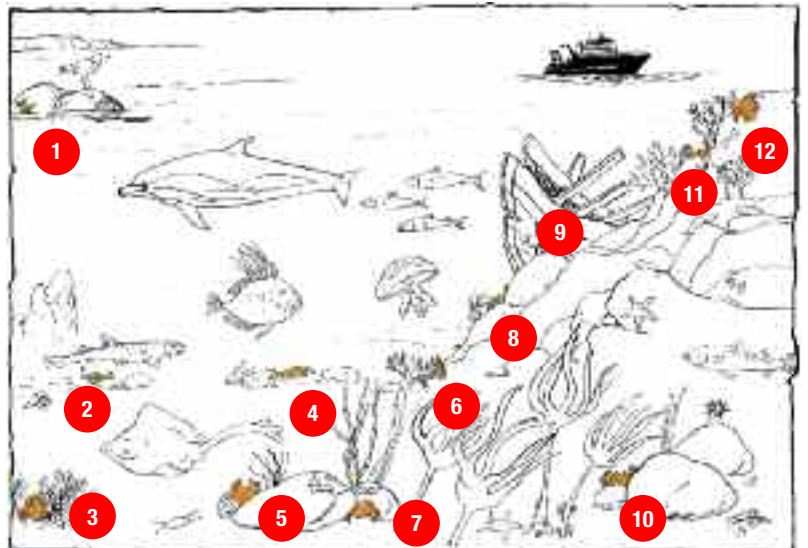
## Marine Bird Life - Name the Sea Birds

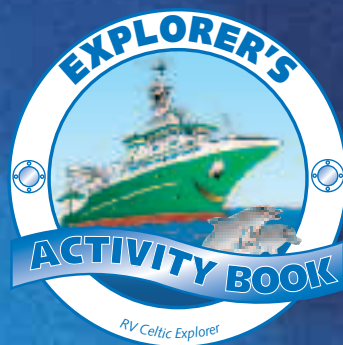
- Fulmer
- Gannet
- Puffin
- Manx Shearwater
- Great Black Billed Gull
- Herring Gull
- Razor Bill
- Black Headed Gull
- Guillemot
- Shag
- Cormorant

## Be the solution to Polution - Spot the Difference



## The Chain of Life - spot Connor the Crab?





**Marine Institute**  
*Foras na Mara*

[www.marine.ie](http://www.marine.ie)

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