



RYA Logbook Theory Notes

Stage 4

Using These Theory Notes

These notes are not intended to totally cover the theory in each stage but instead to provide a guide for students of the RYA Youth Sailing Scheme to supplement their learning from courses and activities.



Produced by the Irish National Sailing & Powerboat School. No unauthorised use is permitted. Use is limited to self-study by students of the Irish National Sailing & Powerboat School and others. This may not be used by other training organisations or sailing clubs without expressed permission of the Irish National Sailing & Powerboat School. Content of these theory notes may not be produced in any format without permission of the Irish National Sailing & Powerboat School. For permission, please contact sailing@inss.ie.

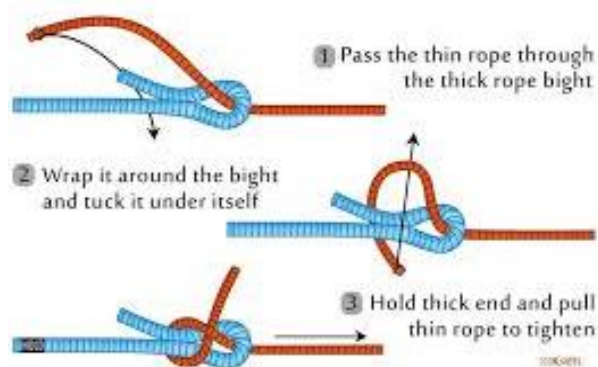
Ropework

Knots

- Figure of eight - taught in stage 1
- Round turn two half hitches - taught in stage 2
- Reef knot - taught in stage 2
- Bowline - taught in stage 3
- Clove hitch - taught in stage 3
- Rolling hitch - taught in stage 3

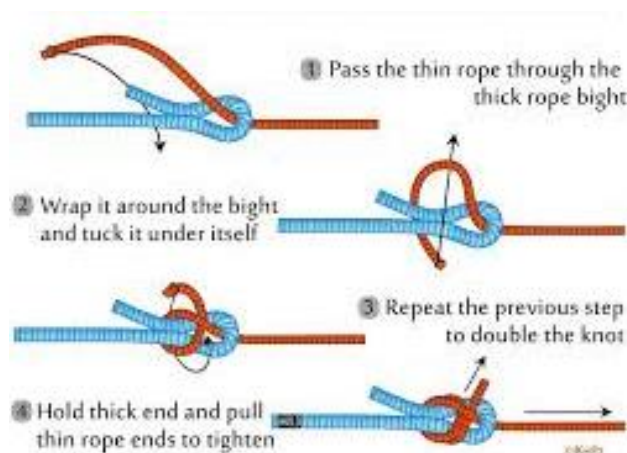
Sheet Bend

- Used for tying two ropes together quickly and reliably, as long as they remain under load.



Double Sheet Bend

- Double sheet bend - Preferable to the single sheet bend. This is because if on the single sheet bend if the load is to come on and off repeatedly it can cause the knot to slip.



Ropework Videos



[Check out our video tutorials here...](#)

Rigging & Launching

Rigging

Can set up a boat according to weather conditions using sail and rig controls e.g. mast rake, reefing.

- **Mast Rake** is the angle at which a mast slopes aft from vertical as viewed from the side.
- **Reefing** is the means of reducing the area of the sail, usually by folding or rolling the sail.
- Removing a reef/s is called “shaking it out”.
- Reefing reduces sail area to make the boat more manageable in stronger winds.

Sailing Techniques & Manoeuvres

Be able to do the sailing techniques and manoeuvres from stage 3 in a crewed boat

- Coming alongside a moored boat/pontoon.
- Picking up a mooring.
- The five essentials
- Sailing on all points of a triangular course
- Tacking upwind
- Gybing from a training run
- Righting a small capsized boat as helm/crew.

Communicate Effectively as Helm and Crew

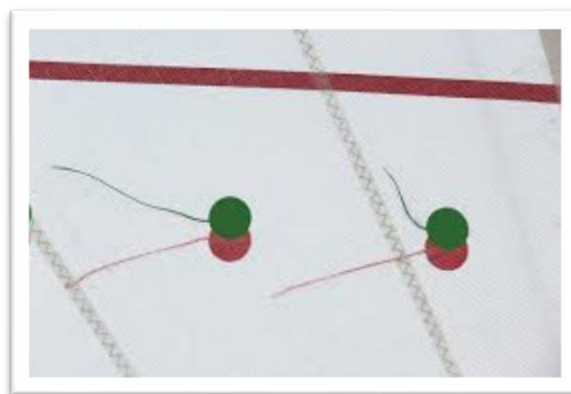
- Efficient sailing relies on good communication and cooperation between helm and crew. The person steering the boat (Helm) needs to communicate what they’re about to do with the crew.
- The crew helps balance the boat and warn the person helming (steering) of any oncoming boats,
- Therefore, we always recommend that whoever is helming the boat counts down when they Tack or Gybe (Turn the boat) i.e. Tacking in 3,2,1...

Effective use of the 5 essentials by helm and crew

	Beat	Reach	Run
Sail Setting	All the way in	Halfway in/out	All the way out
Daggerboard	All the way down	Halfway down	¾ of the way out
Boat Balance	Keep the boat flat	Keep the boat flat	Keep the boat flat
Boat Trim	Forward	Forward	Slightly back
Course Made Good	The route between two points that gets you there the fastest, usually the shortest distance, but not always.		

Using Telltales

- The basic way to read telltales is to get the yarns on both sides of the sail streaming straight back.
- If the leeward one starts to flap, that indicates that you need to point up a bit higher into the wind until it becomes in-line with the windward telltale.
- If the windward telltale begins to flap, that means that you are too into the wind and need to bear away slightly.



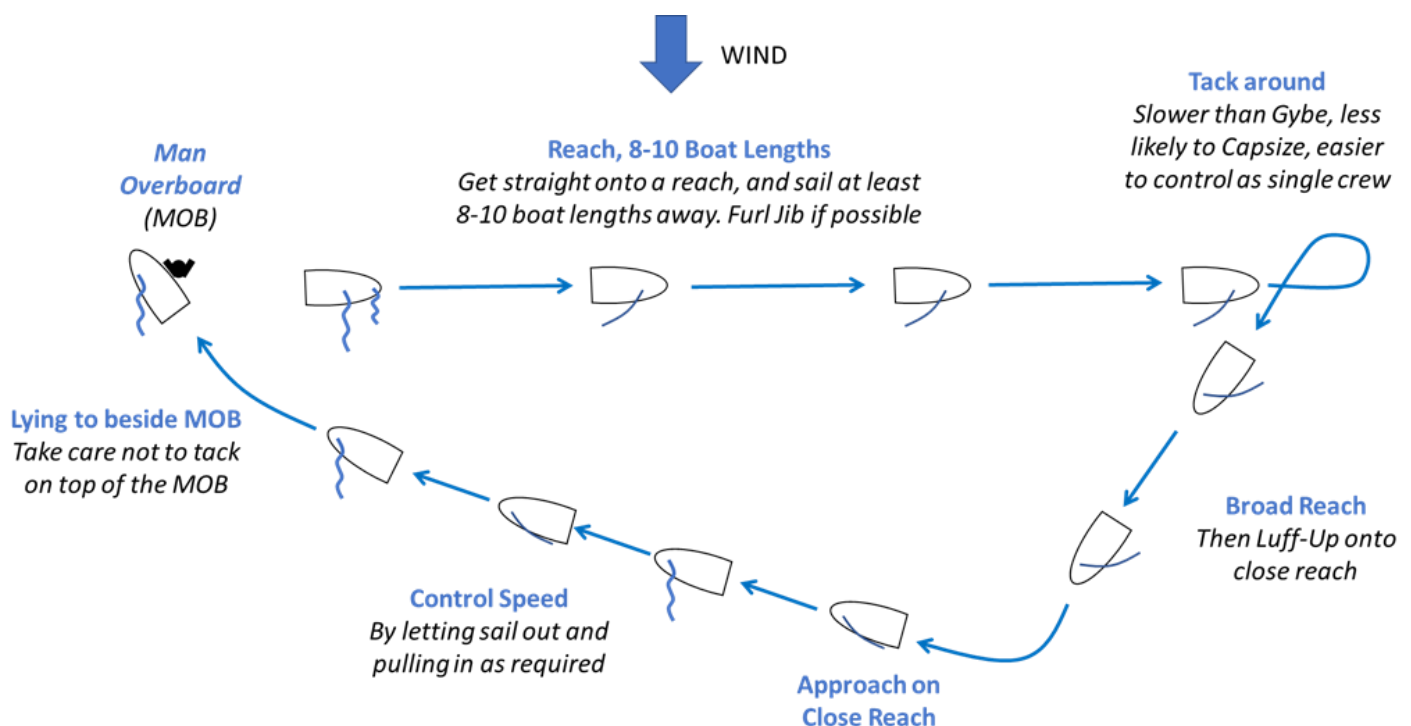
Recover a Man Overboard

Introduction

Why can't I just spin the boat around? Basically, you don't want to miss the MOB and not get back to them, and equally you don't want to get back to them and not be able to stop, therefore causing them injury. The manoeuvre outlined below will give you the best chance to get back to them, and means you're more likely to only have to do the manoeuvre once!

Doing the Manoeuvre

- Firstly, take it slow. You've already dropped someone out. There's no advantage to rushing and getting into more trouble.
- If there's other crew on board, alert everyone by shouting Man Overboard! Assign them a role. The most important is to get someone to point at the MOB all the time. This will help the skipper as it will be tricky to keep their eyes on them all the time.
- Immediately get the boat onto a reach. Sail at least 8-10 boat lengths away. Furl the jib / make the boat as controllable as possible.
- Tack around, tacking is slower, you're less likely to be hit by the boom, and it's easier to control the boat and keep it upright.
- Sail down wind on a Broad Reach. Once you can luff up (point up closer to the wind) so that you'll be approaching the MOB on a close reach, do so,
- Why a close reach? If you're pointing too low you can easily luff up further onto a beat/close hauled. You can't do this if you're already on a beat/close hauled. Equally, it's still possible to "fill and spill" on a close reach, which you can't do on a reach.
- You should have your speed under control, so that you can come to a stop, lying to, beside the person in the water. For dinghies and keelboats, they should be on the windward side of the boat. Why?
 - The boom will be on the other side, meaning the boats less likely to tip over as you pull them aboard
 - Equally, the boom being on the other side keeps it out of your way.
- Take Care not to tack, or end up head to wind. Keep them on the windward side.



You should read the following extra details and understand how to complete the manoeuvre in dinghies.

 [MOB –Videos and Detailed Presentation](#)

Returning to a beach, jetty or mooring in any wind direction

Approaching a Windward Shore/Slipway

When returning to a windward shore or slipway etc, we approach it in a slow manner by filling and spilling our mainsail. Until the boat is stopped over shallow water. Then the crew and helm can disembark and put the boat on a trailer.

Approaching a Leeward Shore/Slipway

With the wind behind, it is an easy approach to a lee shore, but stopping is difficult.

Strong Winds

Arriving at a lee shore in strong winds can be dangerous with steep or breaking waves. Keep to the windward side of the boat when disembarking, as breaking waves or a gust of wind can push the sailboat on top of you. Get the sailing dinghy ashore quickly.

Experience Level Counts

- Experienced sailors may choose to the shore at full speed, round up in the shallows to face the wind, disembark and back their sailing dinghy facing the wind up to the recovery area.
- Less experienced sailors should heave-to some way off shore, lower and stow the mainsail, then sail in under jib only. When reaching the shallows the crew jumps out and holds the bow to windward while the jib is lowered.

Shallow Water

- In shallow water, approach on a broad reach under full sail.
- When the water is about 1m deep, turn into the wind to stop.
- The crew steps out on the windward side to hold the bow
- The helm lowers the sails and removes the rudder.

Safe Approach (can also be used in deeper water where getting out is not possible) (Double handers only)

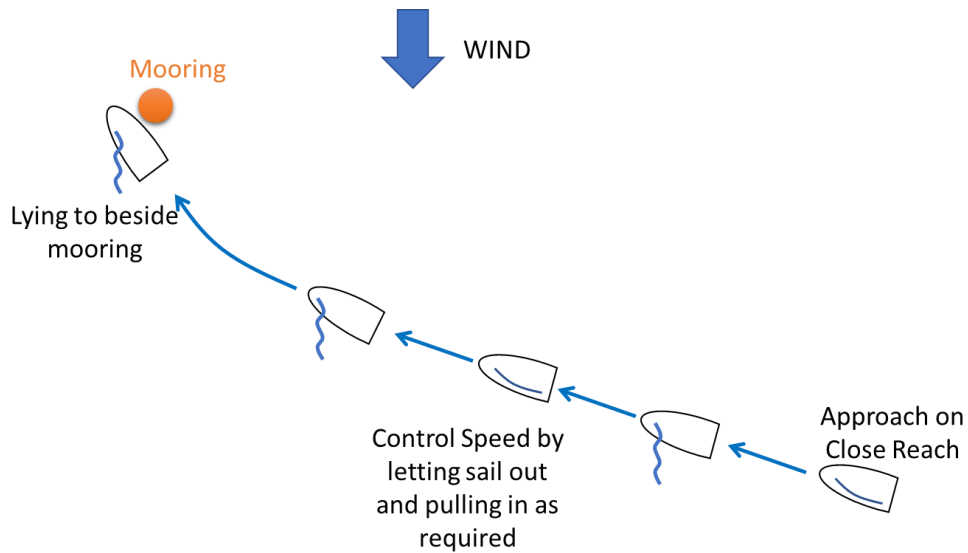
- Some way offshore, turn head-to-wind and lower the mainsail.
- Approach the shore under jib alone on a run or broad reach.
- Close to the shore, let the jib flap and drift in.
- Helm and crew jump out when the water is shallow enough.

Coming Alongside/ Picking Up a Mooring

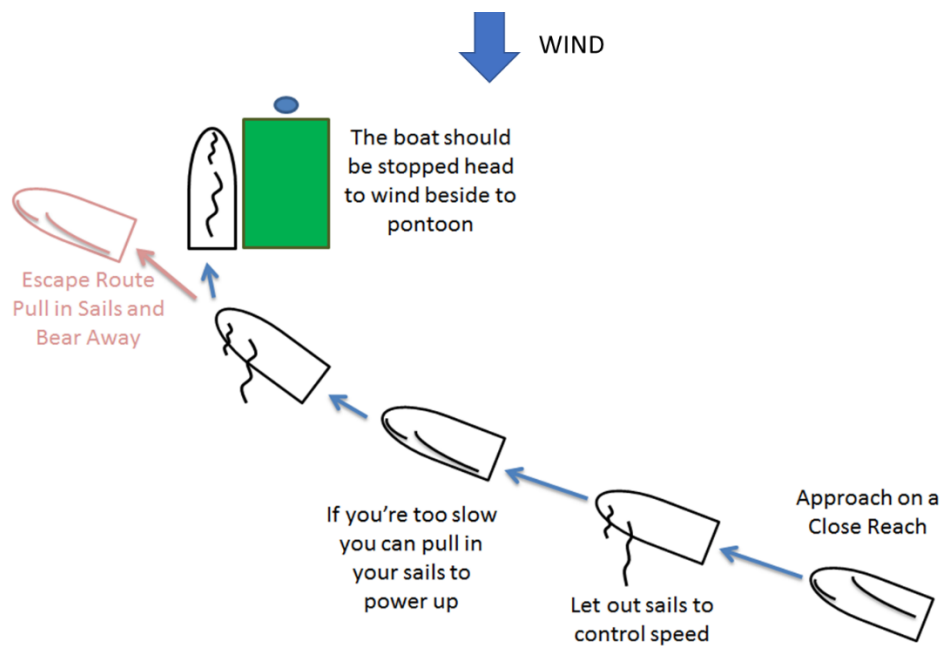
- Position your boat so that you can sail on a reach or a close reach to the pontoon, and that you are 8-10 boat-lengths away.
- If you have a jib, un-bleat it and furl it if you can, and use the mainsail to start to slow by filling and spilling. To do this as you pick up speed let the sail out (spill), and then pull you sail back in (fill) to slowly sail to the far side of the pontoon.
- You should be able to turn up to the pontoon and have come to a stop beside the pontoon.

- If the boat stops before you get to the pontoon and you are too close to the wind to make it, pull the tiller towards you to bear away and try again.

Picking Up a Mooring



Coming Alongside



Sailing Background & Theory

IRPCS

The International Regulations for Preventing Collision at Sea. The regulations govern the following:

- Response of vessels in any condition of visibility.
- Response of vessels in sight of one another.
- Conduct of vessels in restricted visibility.
- Light and shapes to be carried by various craft.
- Sound and light signals between craft.
- Positioning of lights and shapes on board.
- Frequencies of sound signals.
- Distress signals.

Beaufort Scale

You should have an excellent knowledge of the Beaufort wind scale, described in the stage 3 notes.

Knows how to recover from total inversion

As you would expect, you'll need to lean out of the daggerboard or centreboard to get the boat lying on its side on the water. The important thing is to start with your back to the wind when leaning, that way you'll make sure that when the boat comes to be on its side, you'll be to the windward side of it!

Synoptic Charts & Weather

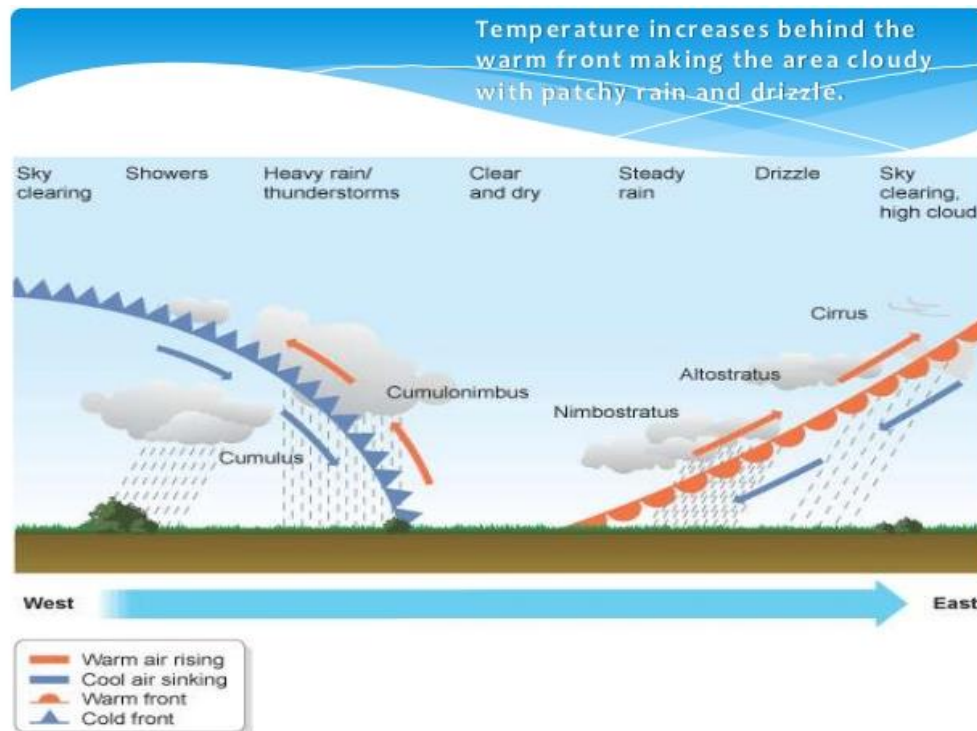
Causes of weather

- The weather systems we experience are caused by the movement of air created by the warming of the earth.
- Hot air at the equator rises and is replaced by cooler air moving in from elsewhere.
- The irregular distribution of land and water masses creates a pattern of hot and cold areas, producing bands of high and low pressure.
- The spinning of the earth allows these highs and lows to move, collide and mix with each other, causing weather systems.

Depression or 'Low' Pressure Weather Conditions

- Unsettled weather
- Rainfall - often heavy
- Strong winds pointing towards the centre - anticlockwise in the northern hemisphere, clockwise in the southern hemisphere.
- A general direction of travel from west to east.
- Closely spaced isobars.

The Progression of a Depression



Types of Cloud in a Depression

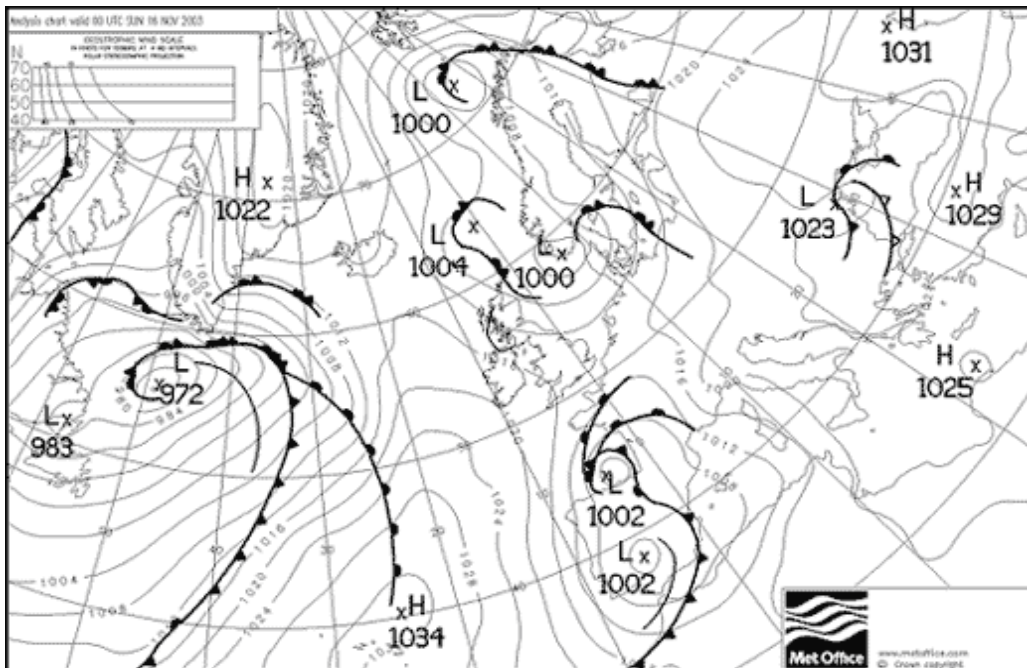
- **Cumulus:**
 - As the cold front arrives the pressure can drop again.
 - There may be heavy rain, strong winds and perhaps thunderstorms.
 - The cloud is cumulus or cumulonimbus.
- **Low cloud and rain:**
 - In the warm sector the barometer stops falling.
 - The rain either ceases or eases, but the cloud base is low with poor visibility.
- **Altostratus thickening to nimbostratus:**
 - The cloud continues to thicken, becoming nimbostratus, and the cloud level has lowered.
 - As the front approaches it begins to rain.
- **Cirrostratus:**
 - The cloud has thickened into cirrostratus and the barometer continues to fall.
 - The wind direction 'backs' (moves anticlockwise), often from a south-westerly direction to southerly.
- **High cirrus cloud:**
 - The high, thin cirrus clouds indicate the approach of a depression.
 - The barometer starts to fall.

Anticyclone or 'High' Pressure Weather Conditions

- Good settled weather
- Clear skies
- Light winds point away from the centre - clockwise in the northern hemisphere, anticlockwise in the southern hemisphere.

- Widely spaced isobars.

Synoptic Charts



Understanding the chart...

- The lines on a weather chart join areas of equal pressure - these are called isobars.
- The closer these lines are together the greater the pressure gradient and the greater the wind speed.
- At the intersection of high and low - pressure systems the rotation of the wind may combine to create wind speeds greater than implied by the isobar spacing.
- Adjacent low-pressure systems may create the opposite effect, with winds being lower than implied by the spacing.
- Synoptic charts often contain a wind-speed key (top left corner of the map).

Coastal (optional)

At the Irish National Sailing & Powerboat School centres, we operate mostly in tidal waters. That said, tide can affect how the boat moves. Your instructor will get you to do the manoeuvres in an area with a tidal flow to feel the effects.

Can apply IRPCS afloat

- The International Regulations for Preventing Collision at Sea. Check out our guide prepared by Powerboat Instructor Jeff Fahy for more details



[IRPCS Video and Notes](#)

- The rules of the road: Refer to Stage 3

Has a basic knowledge of IALA

IALA stands for the International Authority of Lighthouse Authorities. The Irish Lighthouse Authority is Irish Lights, whose headquarters are located in Dun Laoghaire Harbour.

- Check out Irish Light's website: www.irishlights.ie

There are two IALA systems, this guide describes system A, which is used in Europe, Russia, India, Australia and New Zealand (pretty much the whole world excluding North America).

Lateral/Channel Marks:

- These are used to indicate the port (left) and the starboard (right) sides of the channels when travelling in the Direction of Buoyage, that is into the port from sea.
- Port hand marks are coloured **red** and the basic shape is cylindrical (can). If lit, the light will be red and may have a rhythm. This mark would be on the port hand side of a vessel when travelling in the direction of buoyage



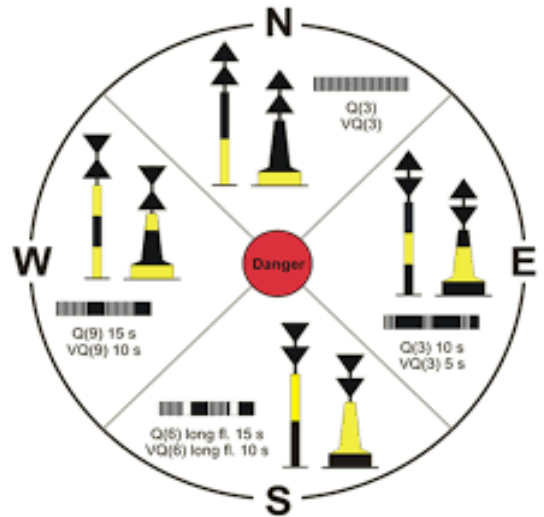
- Starboard hand marks are coloured **green** and the basic shape is conical. If lit, the light will be green on any rhythm. This mark would be on the starboard side of a vessel when travelling in the direction of buoyage.



Cardinal Marks:

- These are used to indicate the location of the best navigable water, to show the safe side on which to pass danger (rocks, wrecks, etc.) and to draw attention to a feature in the channel.
- The marks are placed in one of four quadrants: north, south, east or west.
- The shape of the cardinal mark is not significant but, in this case it will be a pillar or spar.
- The most important daylight feature of the cardinal mark is the black double cone top mark and the four different arrangements that indicate the relevant direction from the mark.
- Black and yellow horizontal bands are used to colour the cardinal marks.

- The **North Cardinal Mark** - has two black cones pointing up. If seen, ensure to pass on the northern side of the mark.
- The **East Cardinal Mark** - has two cones pointing away from each other. Looks like an egg. East = **E**gg shape. If seen, ensure to pass on the eastern side of the mark.
- The **South Cardinal Mark** - has two cones pointing down. If seen, ensure to pass on the southern side of the mark.
- The **West Cardinal Mark** - has two cones point to point. Looks like a Wine glass. **W**est = **W**ine glass shape. If seen, ensure to pass on the western side of the mark.



Isolated Danger Mark

- These are on, or moored above, an isolated danger of limited extent that has navigable water all around it.
- The colours are red and black horizontal stripes and the mark is fitted with a vertical double black sphere.
- If lit, the light will be white.
- Isolated Danger Marks are not always positioned centrally over a danger and it is therefore advisable not to pass too close.



Special Mark

- These are used to indicate a special area or feature, the nature of which may be found by consulting a chart, for example, swimming areas, underwater pipes.
- The colour of the special mark is always yellow and the top mark is a single yellow X.
- If a light is fitted, it will be yellow.



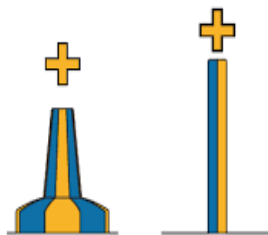
Safe Water Mark

- These marks are used to indicate that there is navigable water all around the mark.
- These marks can be used as a centre line, mid-channel or landfall buoy.
- The shape of the buoy is spherical or pillar and is coloured with red and white vertical stripes (like a candy cane). The top mark is spherical and red.
- If lit, a single long flashing light is exhibited.



New / Emergency Wreck Marking Buoy

- 'New Dangers' should be appropriately marked using lateral, Cardinal, Isolated Danger marks or by using Emergency Wreck Marking Buoy
- The colour of the Emergency Wreck Marking Buoy is blue and yellow vertical stripes, coloured in equal number and dimensions (minimum of 4 stripes and maximum of 8 stripes).
- The top mark is a standing or upright yellow cross.
- The Shape is a Pillar or Spar and the light yellow and blue.



IALA B

IALA B - used in the USA, South America, parts of the Caribbean, South-east Asia and Canada.

- The difference between IALA A and IALA B is the colour and light characteristics used for the lateral marks.
- In IALA B, the use of port and starboard marks are positioned on the opposite side of the channel. Starboard is still green, but instead it appears on the left side of the channel on the way into the port, and vice-versa for the right side.



Tides

- **Spring Tides** occur when the Earth is in line with the moon and Sun, high tides are at their highest and low tides at their lowest.
- **Neap Tides** occur when the Earth, Moon and Sun are not in alignment, high and low tides are smaller than spring tides.
- **Tidal Ebb** is when the tide is flowing out. i.e. water levels inside the harbour go down and low tide occurs.
- **Tidal Flow** is when the tide is rising and eventually, we get high tide.

You should have a basic knowledge of how to use tide tables and how to find the direction of tidal streams.

- A tide table shows the daily predictions for the local time of low and high tides, as well as the height of those tides for a particular coastal area.
- Tidal stream maps are found in almanacs and tidal stream atlases. These show the direction and rate of the tide at hourly intervals before and after high water. For example, the figure '11.21' means that the rate at neaps is at 1.1 knots and at springs it is 2.1 knots. The direction of the arrow gives the direction of flow.

Dublin (North Wall) - April 2020

01 05:23 3.3m 11:27 1.4m Wed 18:07 3.2m 23:59 1.6m	02 06:35 3.3m 12:48 1.4m Thu 19:33 3.2m	03 01:22 1.6m 07:57 3.4m Fri 14:08 1.2m 20:53 3.4m	04 02:34 1.4m 09:11 3.6m Sat 15:13 1.0m 22:01 3.6m
05 03:35 1.1m 10:15 3.9m Sun 16:07 0.6m 22:57 3.9m	06 04:24 0.8m 11:10 4.2m Mon 16:54 0.3m 23:46 4.2m	07 05:10 0.5m 12:00 4.5m Tue 17:38 0.1m	08 00:33 4.3m 05:55 0.3m Wed 12:48 4.6m 18:22 0.0m
09 01:17 4.4m 06:39 0.2m Thu 13:33 4.6m 19:06 0.1m	10 01:59 4.4m 07:24 0.2m Fri 14:17 4.5m 19:50 0.3m	11 02:41 4.3m 08:11 0.4m Sat 15:01 4.2m 20:36 0.5m	12 03:22 4.1m 09:00 0.6m Sun 15:46 3.9m 21:25 0.9m
13 04:06 3.8m 09:55 1.0m Mon 16:37 3.6m 22:21 1.2m	14 04:57 3.6m 10:57 1.2m Tue 17:39 3.3m 23:26 1.5m	15 06:00 3.4m 12:13 1.4m Wed 18:56 3.2m	16 00:43 1.7m 07:15 3.3m Thu 13:33 1.5m 20:16 3.2m
17 02:02 1.7m 08:29 3.3m Fri 14:42 1.4m 21:23 3.3m	18 03:03 1.6m 09:30 3.4m Sat 15:34 1.2m 22:15 3.4m	19 03:51 1.4m 10:19 3.6m Sun 16:16 1.0m 22:57 3.6m	20 04:29 1.2m 11:01 3.7m Mon 16:51 0.9m 23:32 3.7m
21 05:03 1.1m 11:38 3.9m Tue 17:24 0.7m	22 00:06 3.8m 05:36 0.9m Wed 12:13 4.0m 17:56 0.7m	23 00:39 3.9m 06:09 0.8m Thu 12:48 4.0m 18:28 0.6m	24 01:10 3.9m 06:41 0.8m Fri 13:21 4.0m 18:59 0.7m
25 01:41 3.9m 07:14 0.8m Sat 13:53 3.9m 19:32 0.8m	26 02:11 3.9m 07:49 0.9m Sun 14:28 3.8m 20:08 0.9m	27 02:46 3.8m 08:28 1.0m Mon 15:06 3.7m 20:45 1.1m	28 03:22 3.7m 09:12 1.1m Tue 15:50 3.5m 21:31 1.3m
29 04:06 3.6m 10:06 1.2m Wed 16:45 3.4m 22:27 1.5m	30 05:03 3.5m 11:12 1.3m Thu 17:55 3.3m 23:36 1.6m		

Here's our video and more detailed tide lesson.



[Tide Video and Notes](#)