





MARINE NAVIGATION INTRODUCTION TO CHARTWORK



Navigation charts are essential for all boaters headed out on the water. They serve the same principles as you may be familiar with on OSI maps for Hillwalking; geographical features, contours, landmarks, etc.

Sailors are practical folk and nothing is printed on the chart unnecessarily.

Everything is there for a reason and telling us something...

*Don't make the cardinal sin!...
Maps are for land!
Charts are for water!
Don't call a chart a map!*

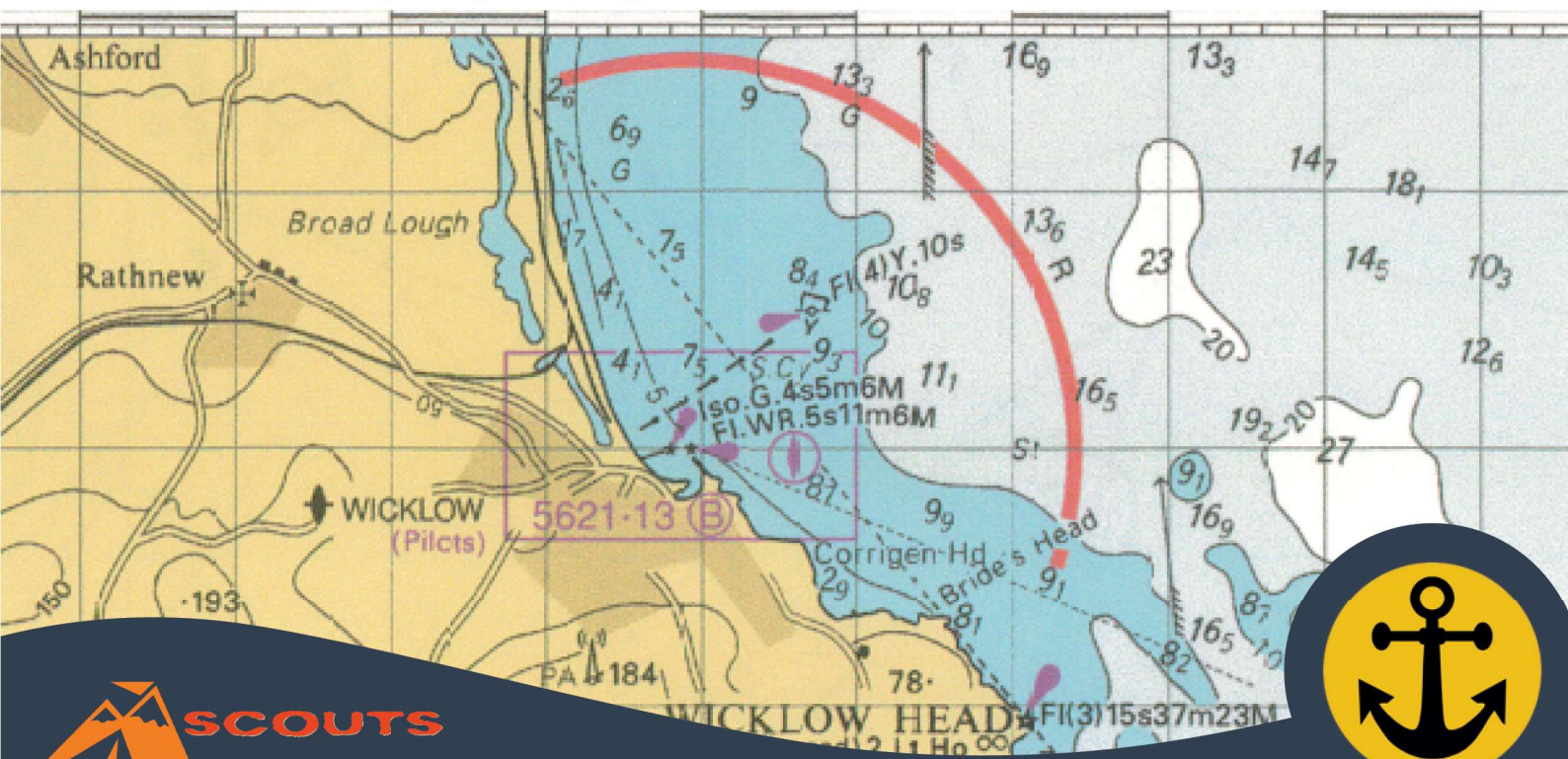
Initially, the chart may seem overwhelming; but let's try identify the basics.

- Can you identify; i) the Contours
- ii) the Depth
- iii) a Lighthouse
- iv) a Spot Height



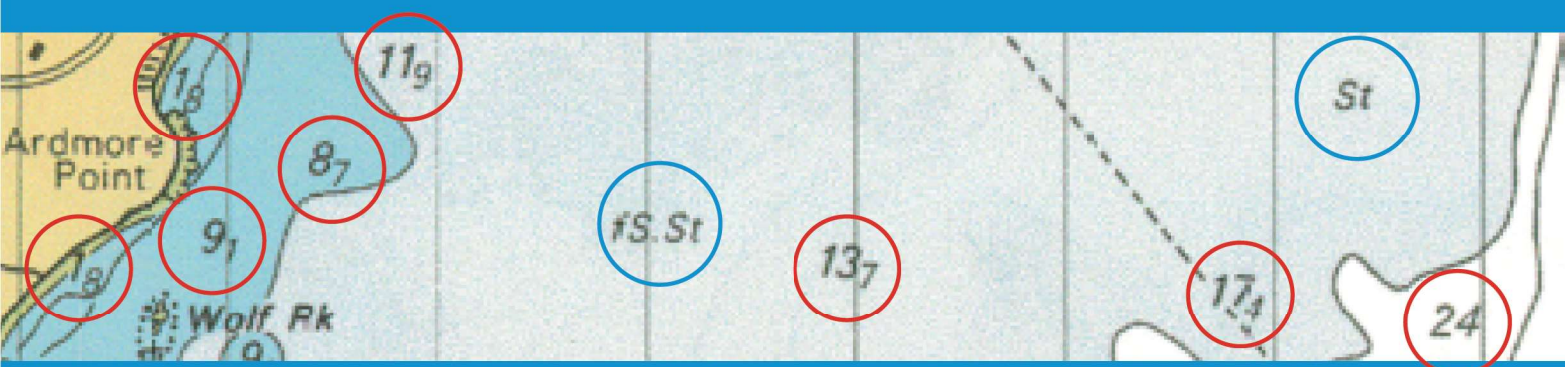
★ This is a Lighthouse

📍 This means the object is emitting a light.





MARINE NAVIGATION WATER DEPTHS



17₄ These numbers are all depth in meters = 17.4m
The small number is the decimal; or cm in this case.

These depths are known as soundings.

St What could this be telling us in relation to the seabed?
Here are some other options you might see...

S
M
G
P
R
Sh
Wd
St

This is telling us the
Nature of the Seabed!

Why do we need to know this?

So what does **fS.St** mean?

Sand
Mud
Gravel
Pebble
Rock
Shell
Weed
Stone

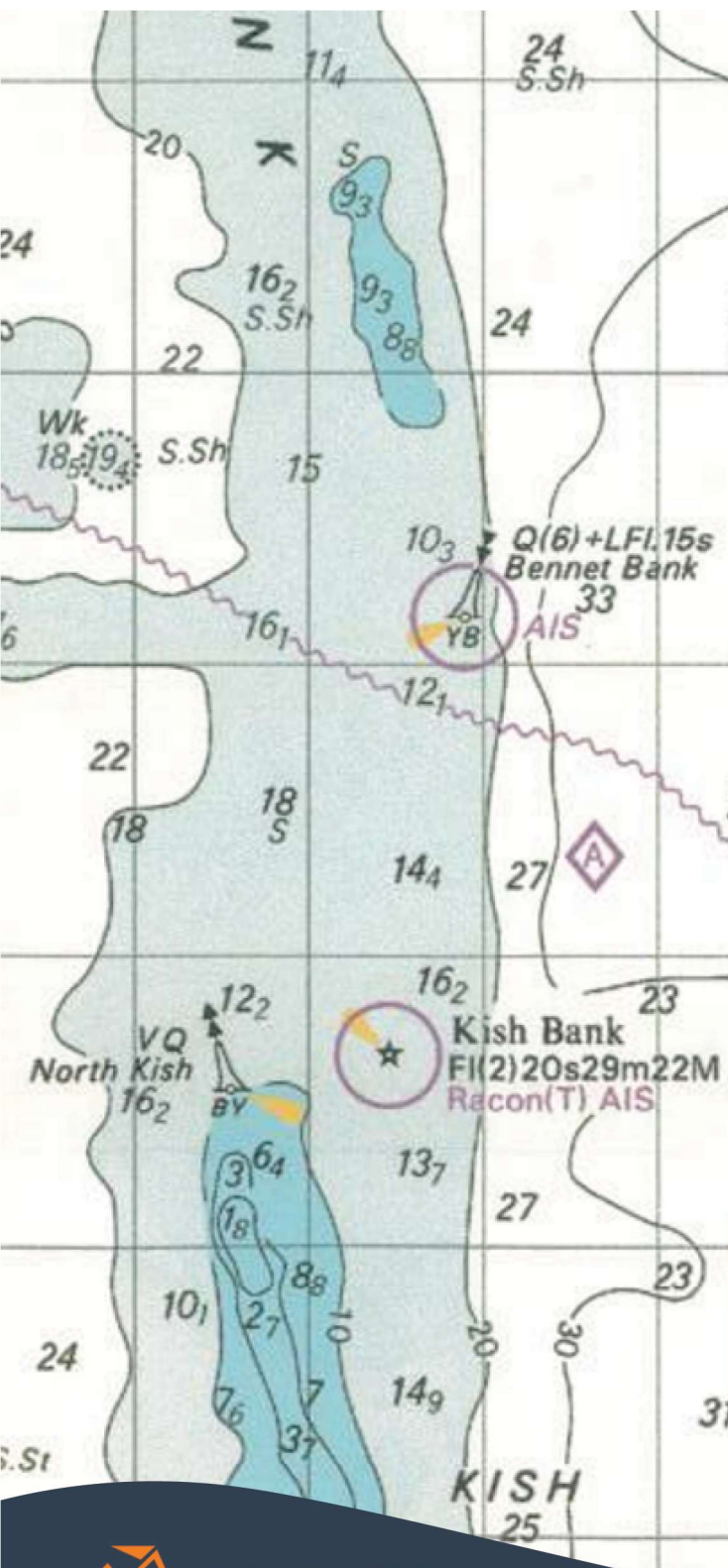
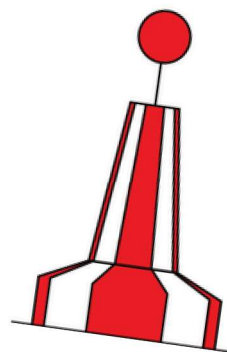
Combined with a
lowercase; detailing
the seabed;

f = fine
m = medium
bk = broken





MARINE NAVIGATION BUOYS & BEACONS



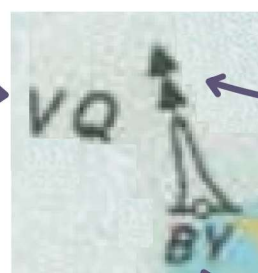
Navigation lights and buoys indicate safe passage, danger and direction.

Each buoy is characterised by it's unique;

1. Colour
2. Top-Shape
3. Light Sequence

For safe passage, we need to recognise the buoys out in the wild and also on the chart, by identifying these 3 characteristics...

3. Light Sequence
Very Quick



2. Top-Shape

1. Buoy Colour
Black & Yellow

This should be more than enough information to identify this buoy as a **North Cardinal** mark.

- A) Identify which direction is the safe passage..
- B) Try identify one of the other two buoys/ beacons on the chart.





MARINE NAVIGATION HAZARDS



We won't see hazards under the surface, so we rely on caution, local knowledge or our chart.



A wreck that can be seen at Low Water.



Wk

Wreck at a depth of 4.6m.



A Wreck at unknown depth, but considered hazardous to navigation.



Obstn

Obstruction/ unspecified depth and danger to navigation.



Underwater rock.

More Chart
symbols here





MARINE NAVIGATION LAND FEATURES



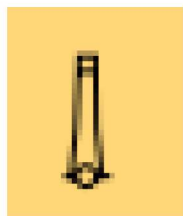
Nautical charts will often feature numerous land features;

- Hills & Spot Heights
- Buildings & Landmarks
- Towers, Chimneys & Church Spires
- Forests

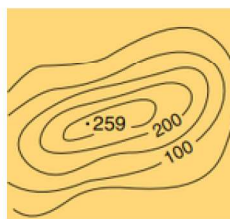
Why are these shorebased
landmarks identified on
the chart?

Any identifiable land feature that
can be spotted from the boat and
used to get a bearing off is an
extremely valuable aid.

See if you can identify the below...



1. _____



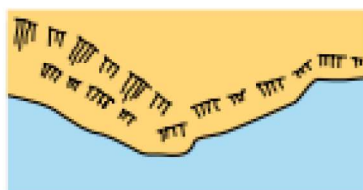
4. _____



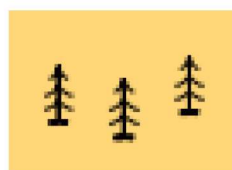
2. _____



5. _____



3. _____



6. _____



#ScoutingIrelandOnTheWater



Scout Helmsmans Mate

Using the knowledge you learned, safely navigate your ship into Dublin Port avoid all hazards...



SCOUTS

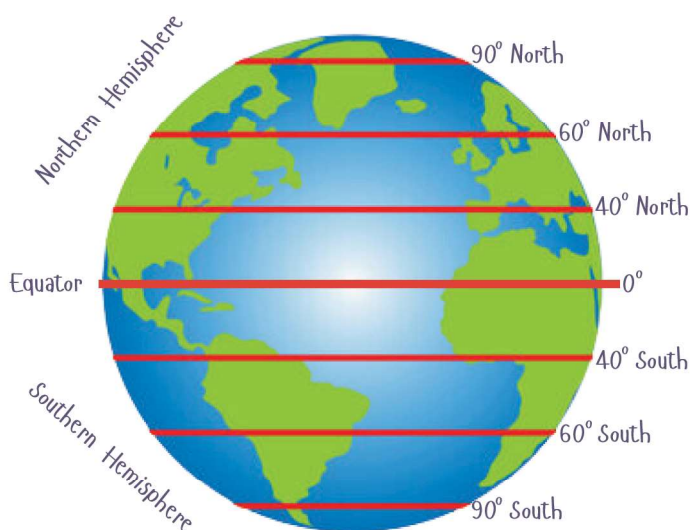




MARINE NAVIGATION COORDINATES

Latitudes and Longitudes are invisible lines across the globe that help us identify where something is. They use a measurement of Degrees.

When used together, they can pinpoint the location of anywhere on Earth, together these are called coordinates.



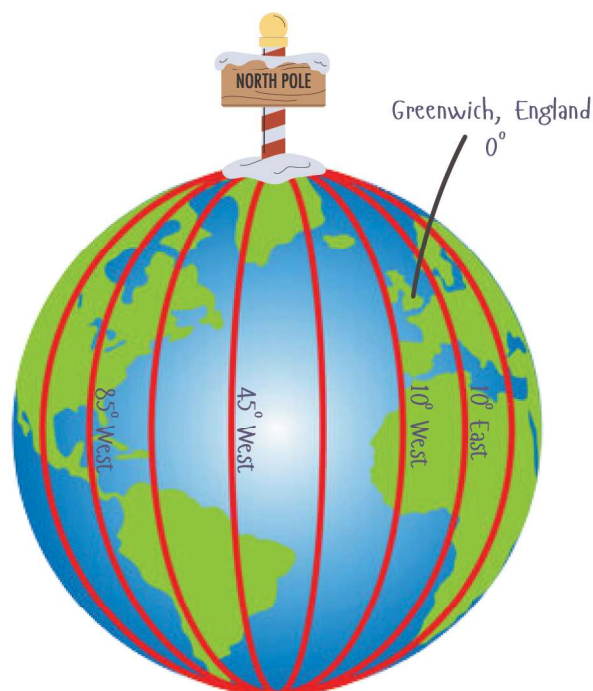
LATITUDE

Lines of Latitude circle the Earth parallel to the Equator - running East to West.

Lines of Latitude describe positions North and South of the Equator; between 0° - 90° North and 0° - 90° South

Ireland is approximately
53° North (of the Equator)

Chile is on 53° South!



LONGITUDE

Lines of Longitude run from North Pole to South Pole. The North-South Line that marks 0° runs through Greenwich, England.

Lines of Longitude East of Greenwich - range from 0° to 180° East.

Lines of Longitude West of Greenwich - range from 0° to 180° West.

Ireland is approximately
006° West (of Greenwich)



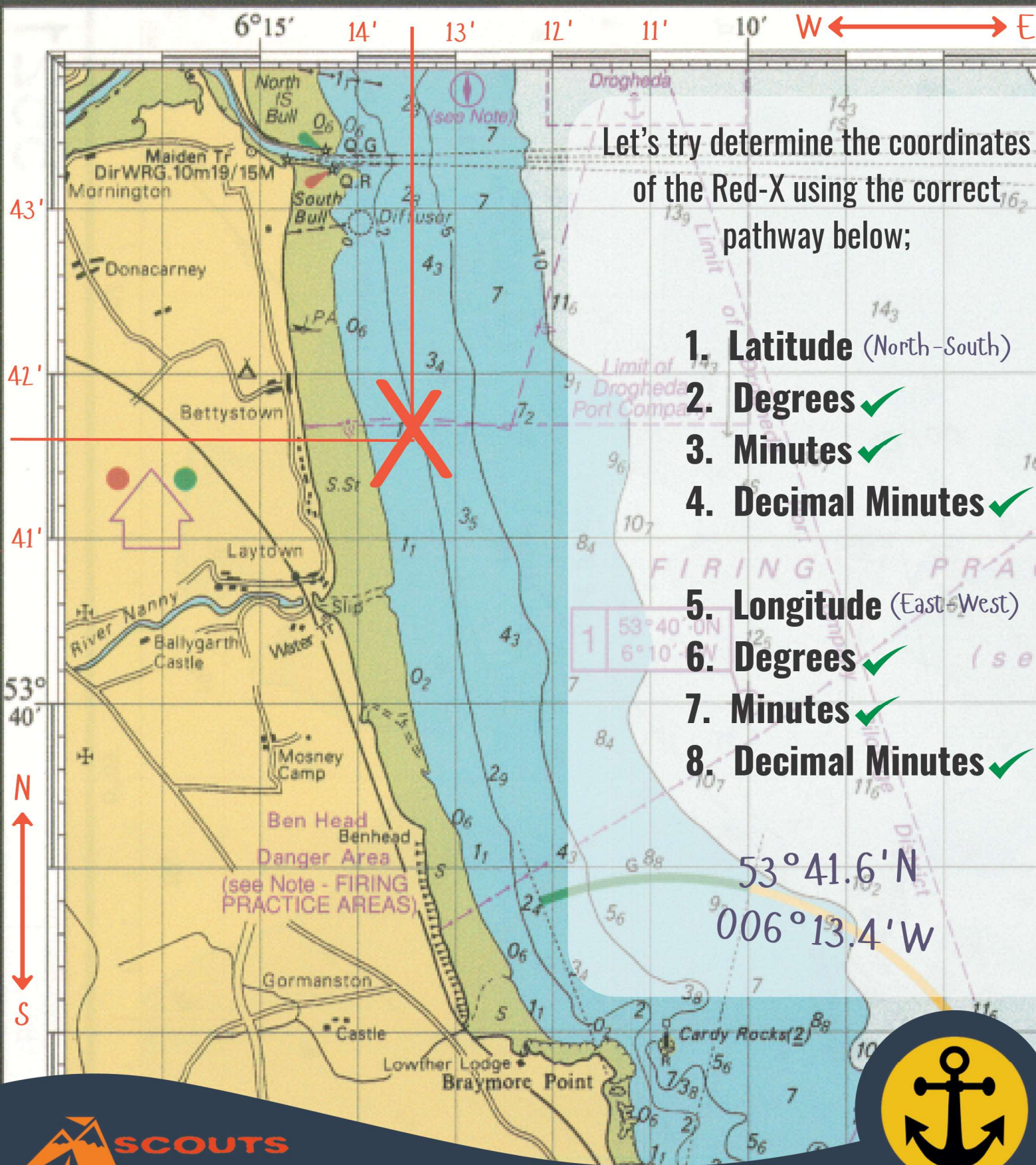


MARINE NAVIGATION PLOTING

Let's try determine the coordinates of the Red-X using the correct pathway below;

1. **Latitude** (North-South)
2. **Degrees** ✓
3. **Minutes** ✓
4. **Decimal Minutes** ✓
5. **Longitude** (East-West)
6. **Degrees** ✓
7. **Minutes** ✓
8. **Decimal Minutes** ✓

$53^{\circ}41.6'N$
 $006^{\circ}13.4'W$





MARINE NAVIGATION PLOTING



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Mate

Using the previous example, let's review the coordinates we calculated...

When Plotting Coordinates, we always start with - Latitude first

- Longitude second

Remember, Latitude is the measure of how far North or South you are from the Equator.

As you move further North or South, the latitude coordinates increase.

Longitude is the measure of how far East or West you are from Greenwich, London.

As you move further East or West, the longitude coordinates increase.

Degrees are denoted with $^{\circ}$

Minutes are denoted with '

We always include the compass
cardinal points on coordinates
because there will be a 53°N
and a 53°S latitude.

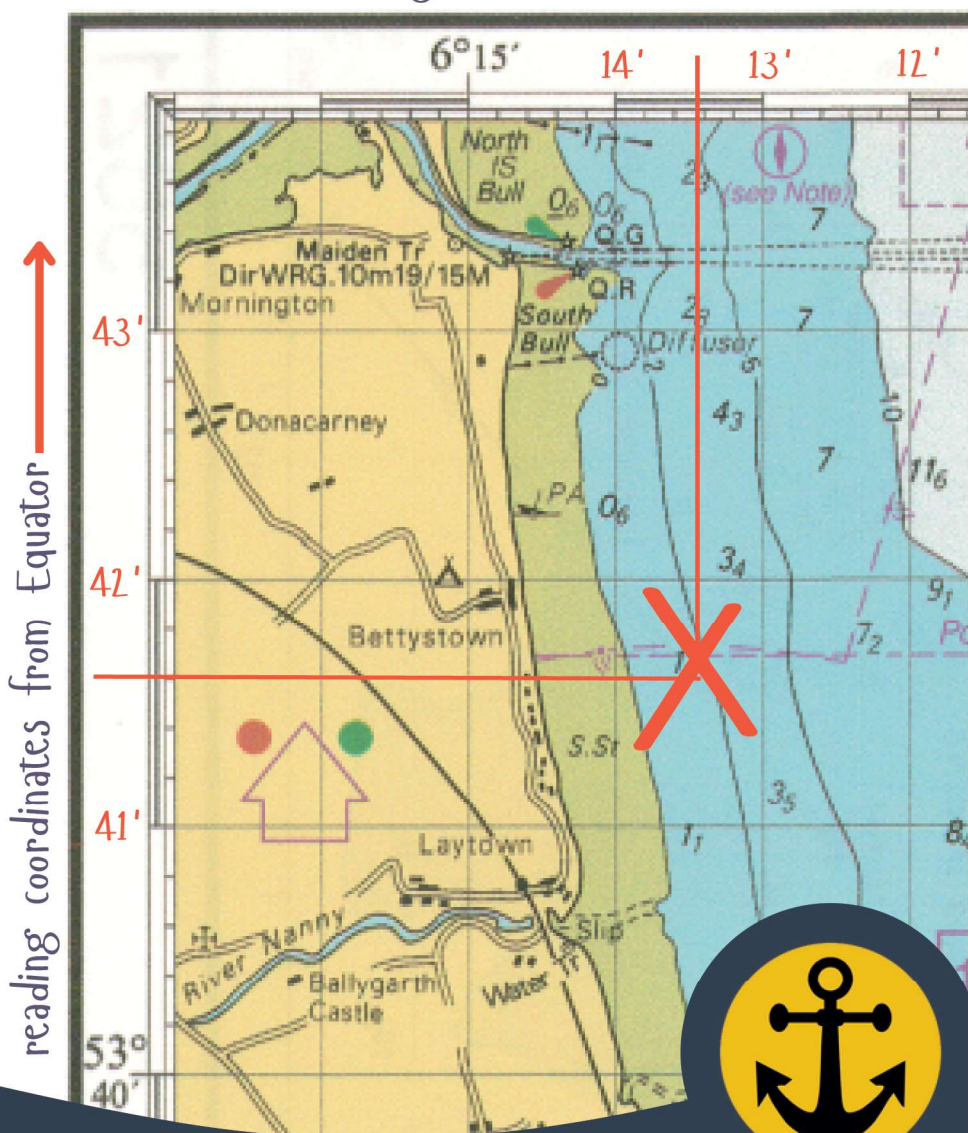
Similarly, there will be a
 006°W and a 006°E longitude.

*Luxembourg!

$53^{\circ}41.6'\text{N}$

$006^{\circ}13.4'\text{W}$

← reading coordinates from Greenwich





MARINE NAVIGATION PLOTting EXERCISES

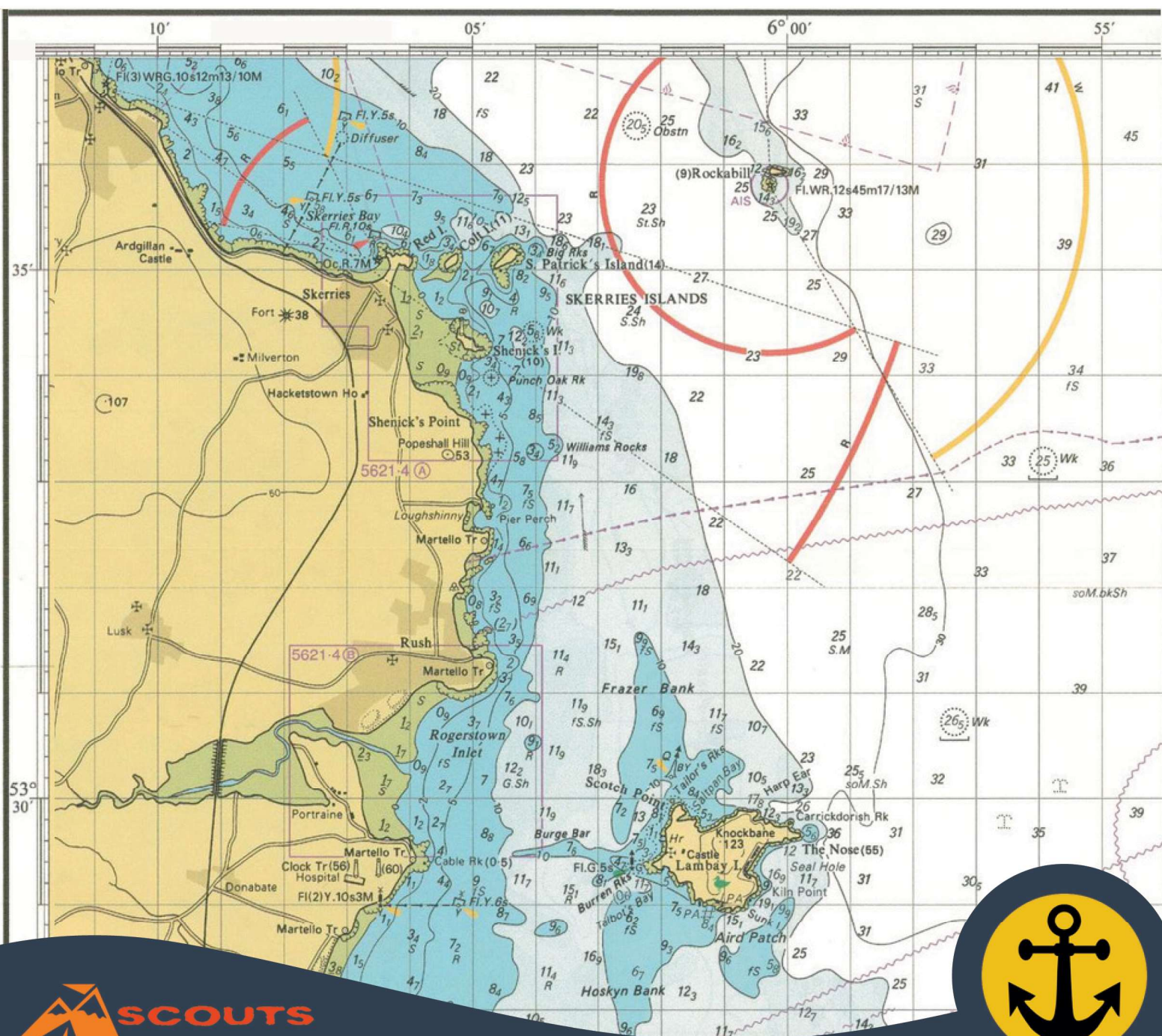
What will you find at:

1. $53^{\circ}29.5'N$
 $006^{\circ}02.1'W$ _____

2. $53^{\circ}35.3'N$
 $005^{\circ}57.6'W$ _____

3. Record the coordinates of
Rockabill Lighthouse. _____

4. Record the coordinates of
Lambay North Cardinal. _____



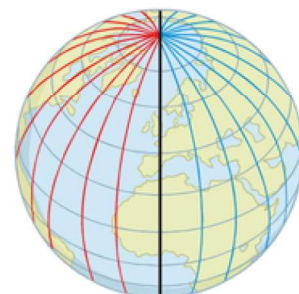


MARINE NAVIGATION DISTANCE

Distance is always measured using the lines of Latitude.

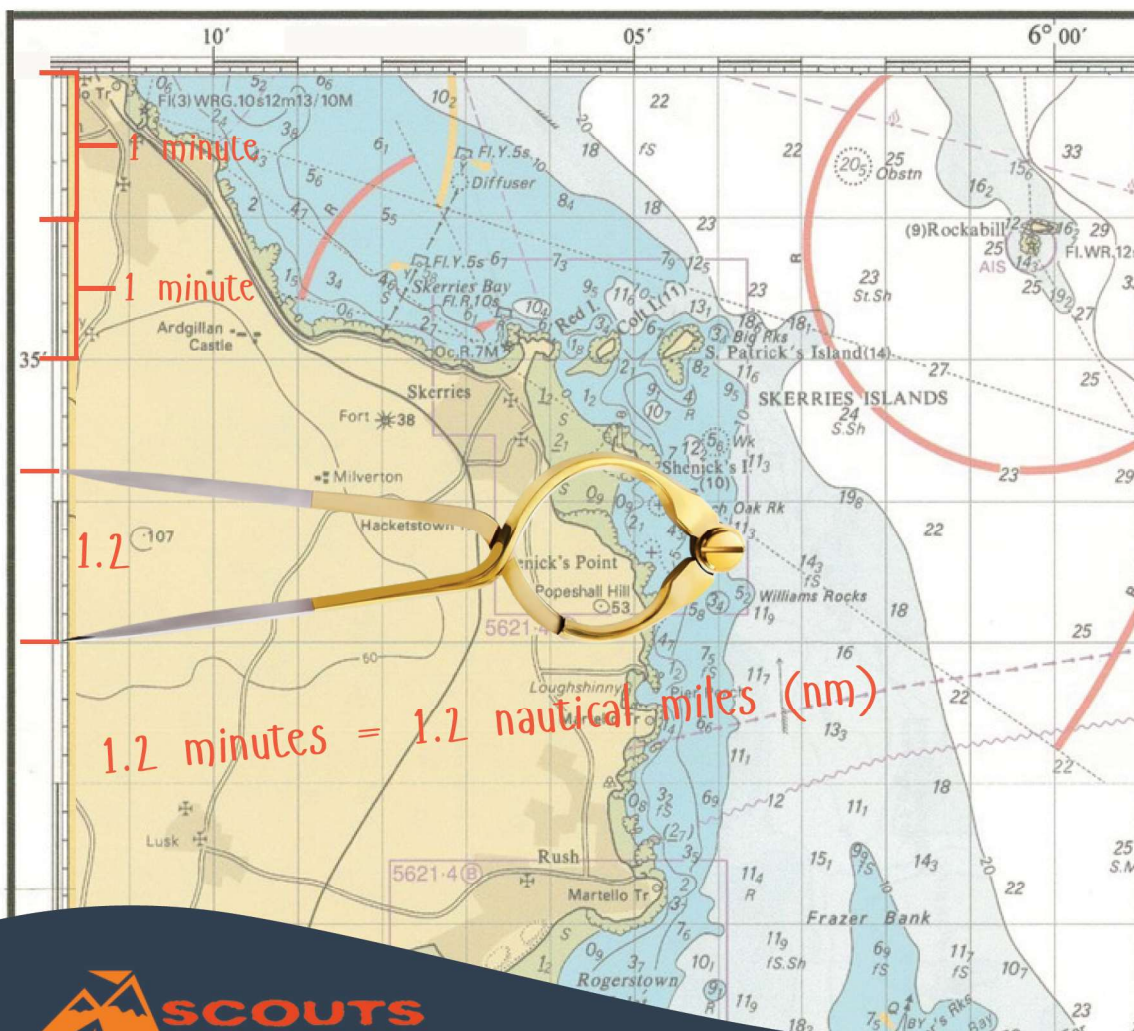
This is because throughout the globe, lines of latitude run parallel to one another and provide a consistent distance.

By comparison, lines of Longitude converge towards the poles and so their distance changes dramatically.



1. Securely place the two ends of the dividers on either end of the points you are measuring.
2. Move the dividers to the Latitude scale and read how many minutes between the two ends.

One Nautical Minute = One Nautical Mile

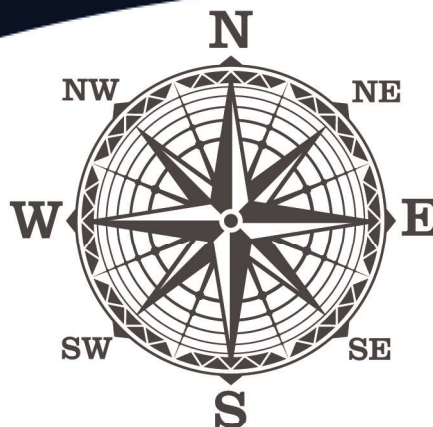


A standard dividers
used for calculating
distance on a chart.





MARINE NAVIGATION VARIATION



Our Admiralty Charts (and OSI Maps) are all set with North-Up; at the top of the page. This is known as **True North**.

While this is convenient, we cannot navigate with this in the wild!

Our compass doesn't point to True North, it points to **Magnetic North**.

Magnetic North is constantly changing due to shifts in Earth's magnetic field.

Today, Magnetic North is somewhere in Canada!

Knowing how to calibrate our chartwork calculations to our compass is really important.

The difference between True North and Magnetic North is called Variation.

If we're rough and ready, we can guesstimate our Ireland variation is approximately $+3^\circ$...

While this might be OK walking a couple of KM from spot height to spot height, it is not OK for navigation at sea.

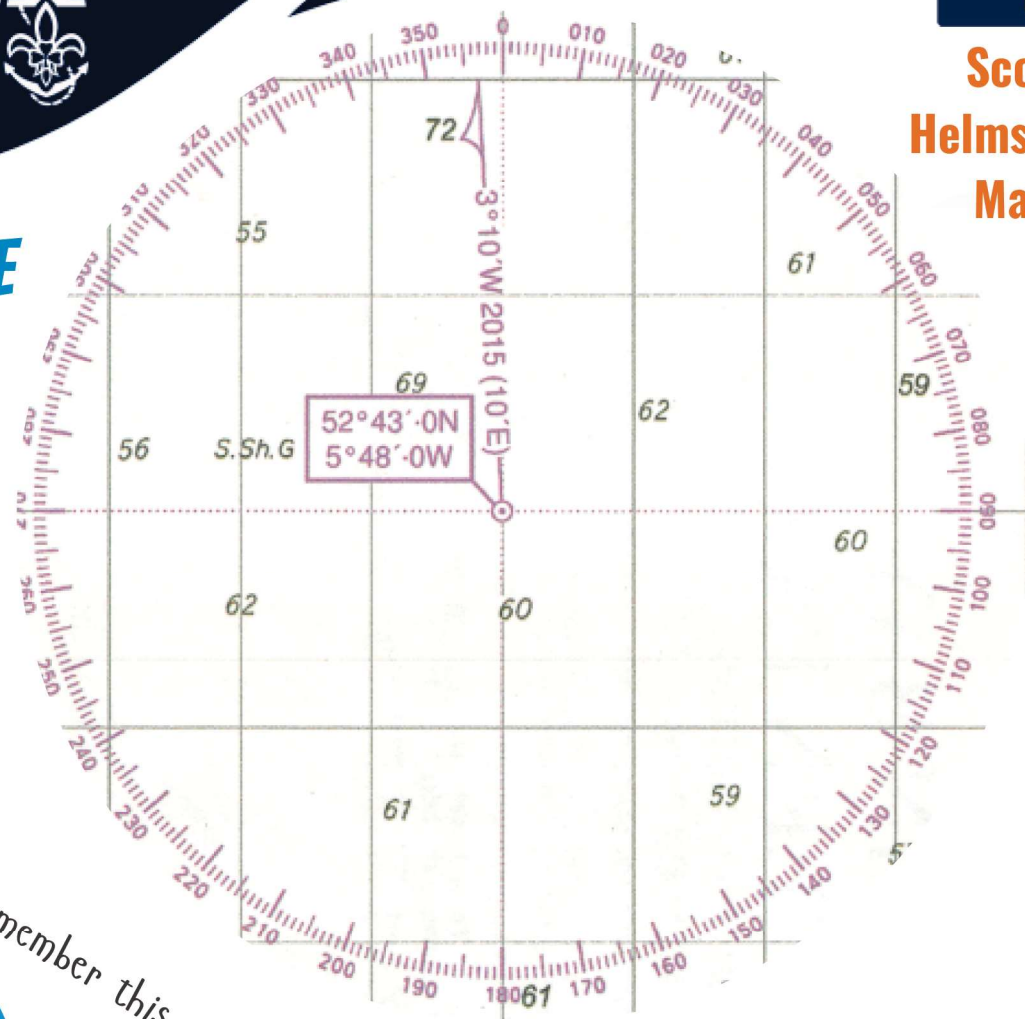
The sea can have little to no reference points and distances are generally much longer; so accuracy is vital to ensure we can make it home safely.

$$\begin{aligned}\text{True Bearing} &= 90^\circ \\ \text{Variation} &= +3^\circ \\ \text{Compass} &= 93^\circ\end{aligned}$$





COMPASS ROSE



Every nautical chart will have a Compass Rose detailing the precise variation of that chart location.

**East Least (-)
West Best (+)**

If it's an East variation,
minus it.
If it's West, add it.

Remember this

This is the change
each year.

3°10'W 2015 (10'E)

This is the
variation in 2015

Calculating for 2024:

- 10'E is the change each year (x9-years)
= 10'E x 9 is 90'E
There is only 60' in a degree, so
90'E = 1°30'E.
- 3°10'W minus 1°30'E
= 2°W Variation 2024.

Minus because it is
an E change.

Removing the minutes as
we can't navigate to this.

We will typically ignore the minutes
(10') as we will accept, monitor and
correct a small error when navigating
manually on short trips.





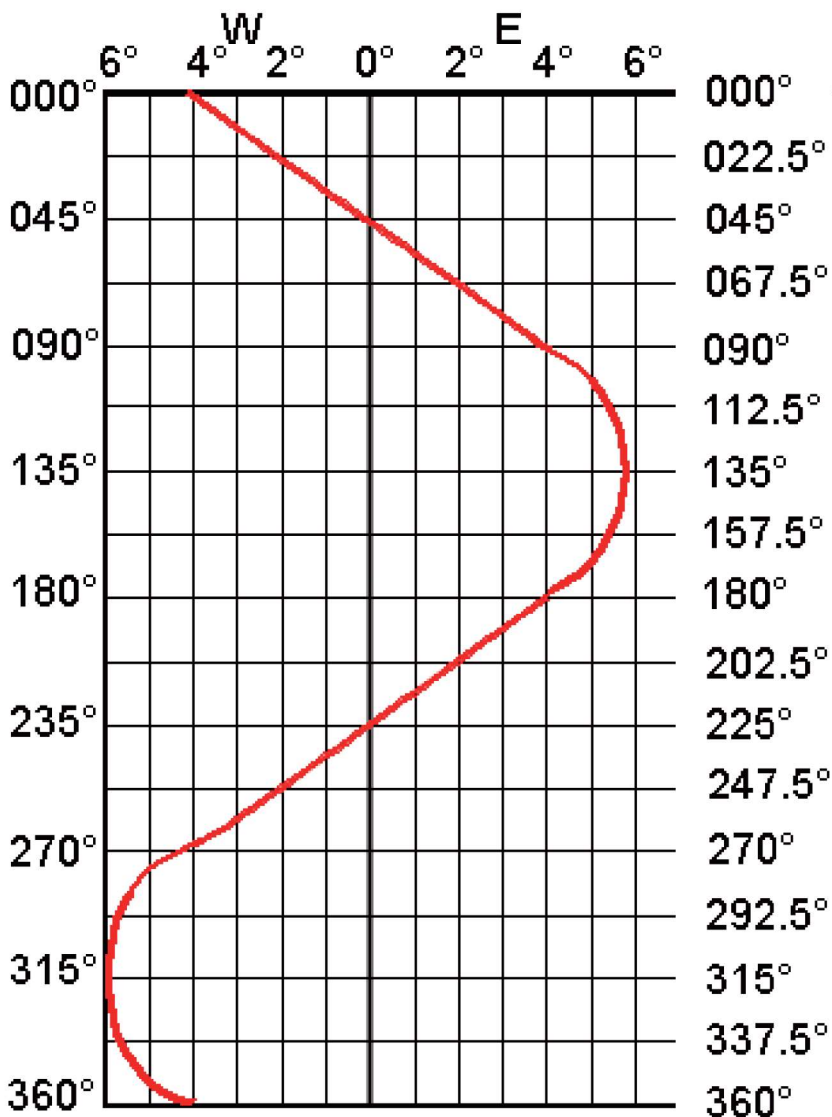
MARINE NAVIGATION DEVIATION



The final piece of the puzzle is to calculate Deviation.

While Variation is the global compass corrections on account of the Earth's magnetic field, Deviation is the local interference.

This compass error could be your mast, engines, hull, rigging; all impacting the compass.



This is a **Deviation Card** calculated for a specific vessel. It shows the compass deviation for different headings of a ship. It helps navigators account for errors in the magnetic compass.

True -
Variation -
Magnetic -
Deviation -
Compass -

TV Makes Dull
Company

Remember this!

Same compass rules
apply!

East Least (-)
West Best (+)
If it's an East variation
subtract it.

Pass your watch or phone over a magnetic compass.
This needle deflection is Deviation!

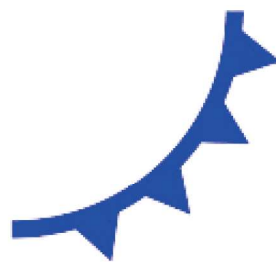




RAIN OR SHINE READING SYNOPTIC CHARTS

Synoptic charts are global weather maps that can tell us a huge amount of information if we know how to read them.

Most useful for us, is we can use the data to create accurate weather predictions for our activities now and for later.



Air Pressure ✓
Wind Strength ✓
Wind Direction ✓
Precipitation ✓
Cloud Cover ✓
Temperature Patterns ✓
Significant Weather Events ✓

Synoptic Chart Glossary

H High Pressure System (Anti-Cyclone)
Typically associated with settled weather.
Wind blows Clockwise

L Low Pressure System (Depression)
Typically unsettled weather.
Wind blows Anti-Clockwise



Isobars are lines indicating atmospheric pressure.

They help us identify pressure systems and indicate which way the wind is blowing.
The tighter the lines, the stronger the wind.

The further apart, the weaker the wind.

Warm Front

A warm front is the leading edge of a warm air mass.

Fronts often bring rain. Behind the warm front, temperatures typically increase.

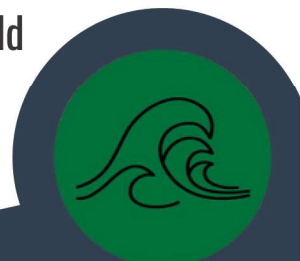
Cold Front

A cold front is the leading edge of a cold air mass. They can move twice as fast as a warm front.

Fronts often bring rain. Behind the cold front, temperatures are typically cooler.

Occluded Front

Is when a warm & cold front meet and mix.
Thick cloud and rain.



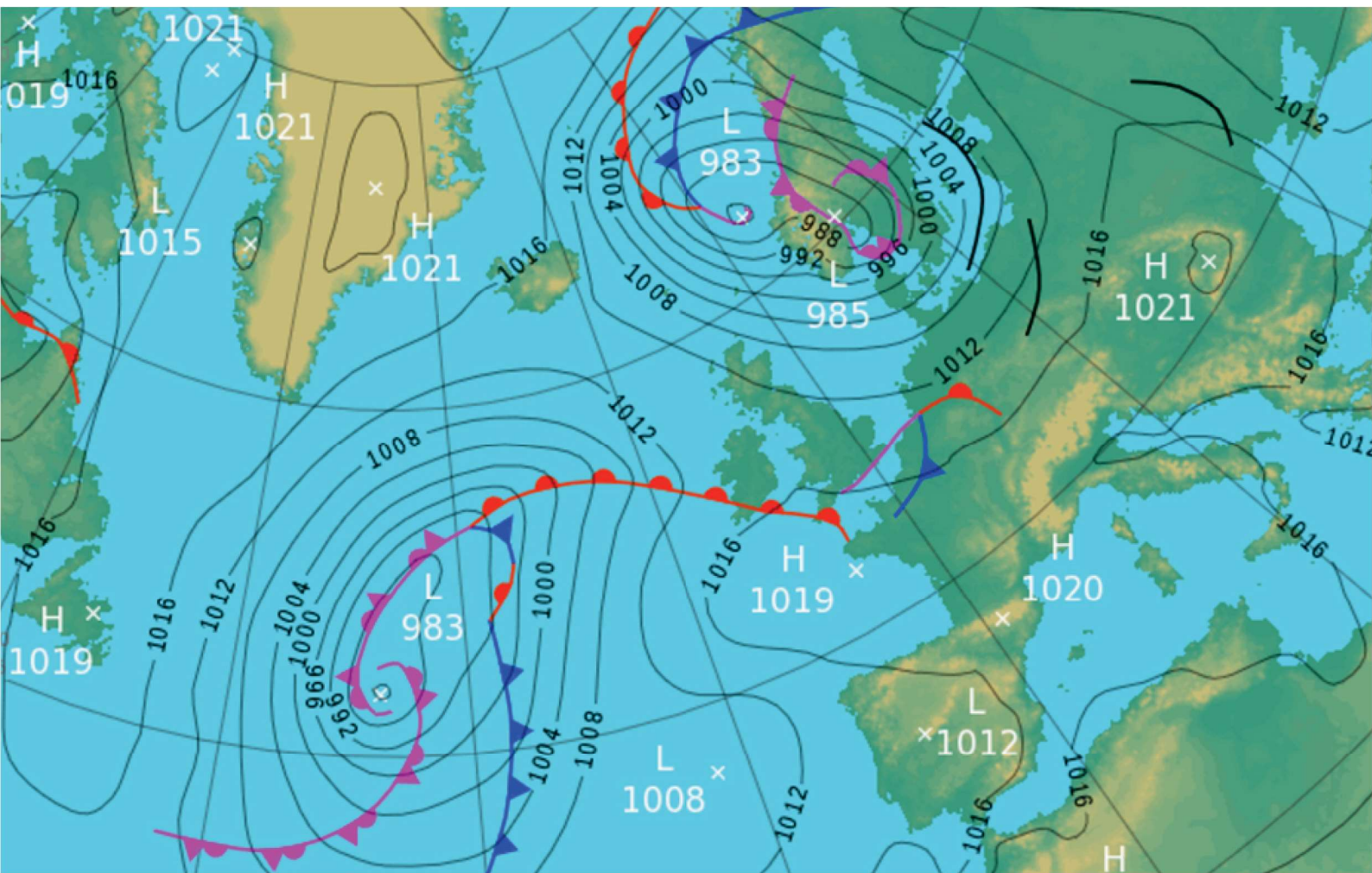


SYNOPTIC CHARTS

sometimes known as a Surface Pressure Chart



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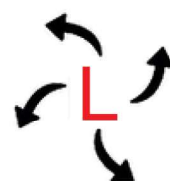
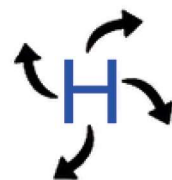
What wind direction is Denmark experiencing?

What kind of weather is Ireland experiencing?

What is happening with the isobars over France?

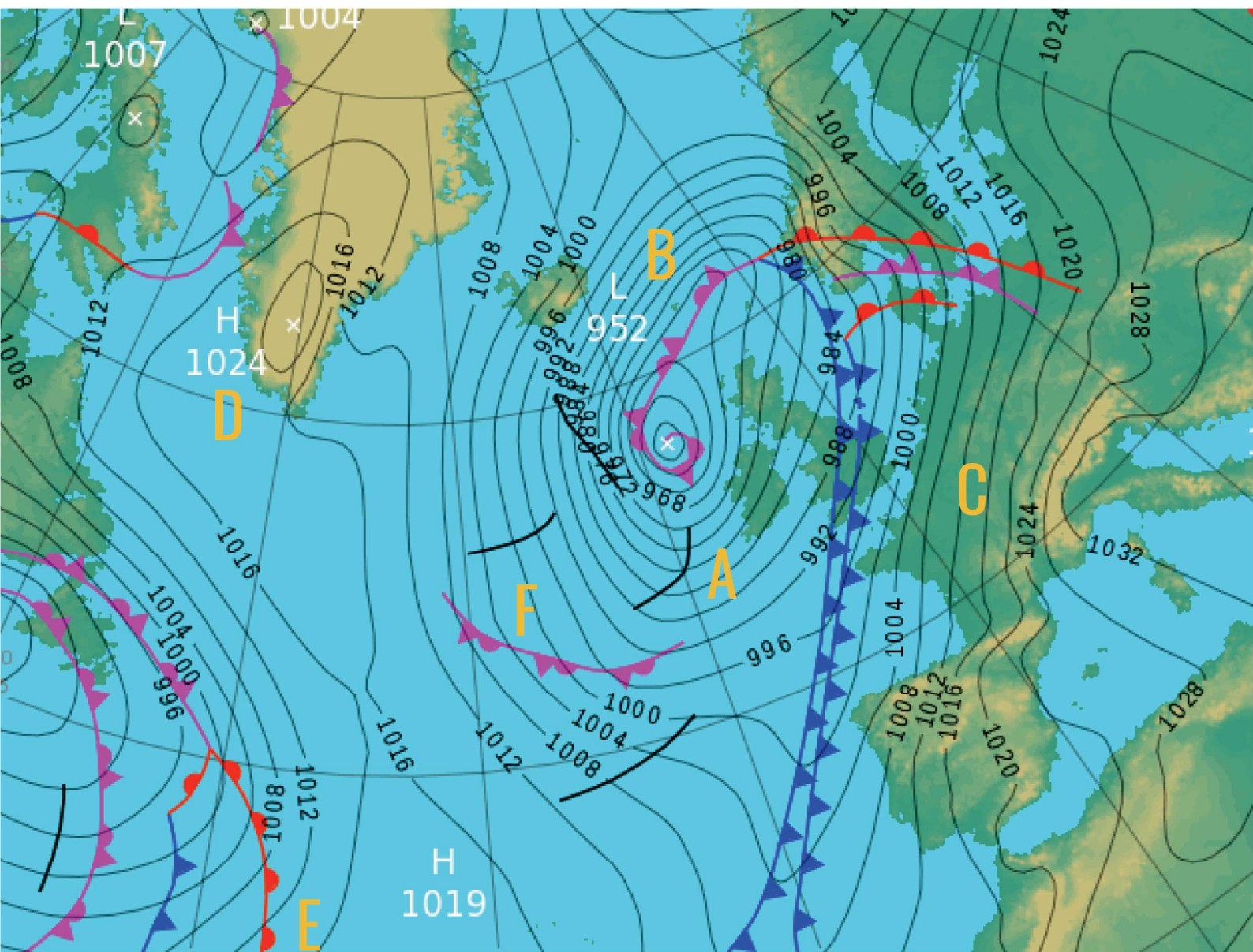
How can we learn what direction a weather system is tracking?

Remember which direction
each system is moving...





SYNOPTIC CHARTS



A - What wind direction will Cork be expecting?

B - What will the wind strength be like here?

C - What wind direction is over Europe?

D - What is here?

E - What is here?

F - What is here?



Standard pressure at
sea level is defined as
1013hPa

Pressure is measured in hectoPascals
(hPa)





CREATING YOUR FORECAST WEATHER TRACKING

Weather tracking is a valuable skill that helps us understand and predict changes in the weather systems around us. By observing patterns we can anticipate what kind of weather might be coming.

Below you will find weather charts collected over a number of days.

Use these charts to analyze trends, track changes and make your own forecasts.

1. Divide into Groups

Form small groups and give each group a copy surface weather charts. The chart should be of a specific area like Ireland, but don't be shy to try Hawaii or another part of the World! Most importantly is to provide a couple days worth of chart data.

2. Observe and Note

Scouts should examine their charts for weather patterns, review which direction systems are tracking and arrangement of the isobars. Write down your observations.

3. Create a Forecast

Based on the data you have analysed, discuss and write down the weather you predict for your selected location and how this might impact activities.

4. Minute Meteorologist

Write a short forecast script to present. Review daily forecasts to understand typical language and information used.



ADVENTURES AFLOAT

#ScoutingIrelandOnTheWater



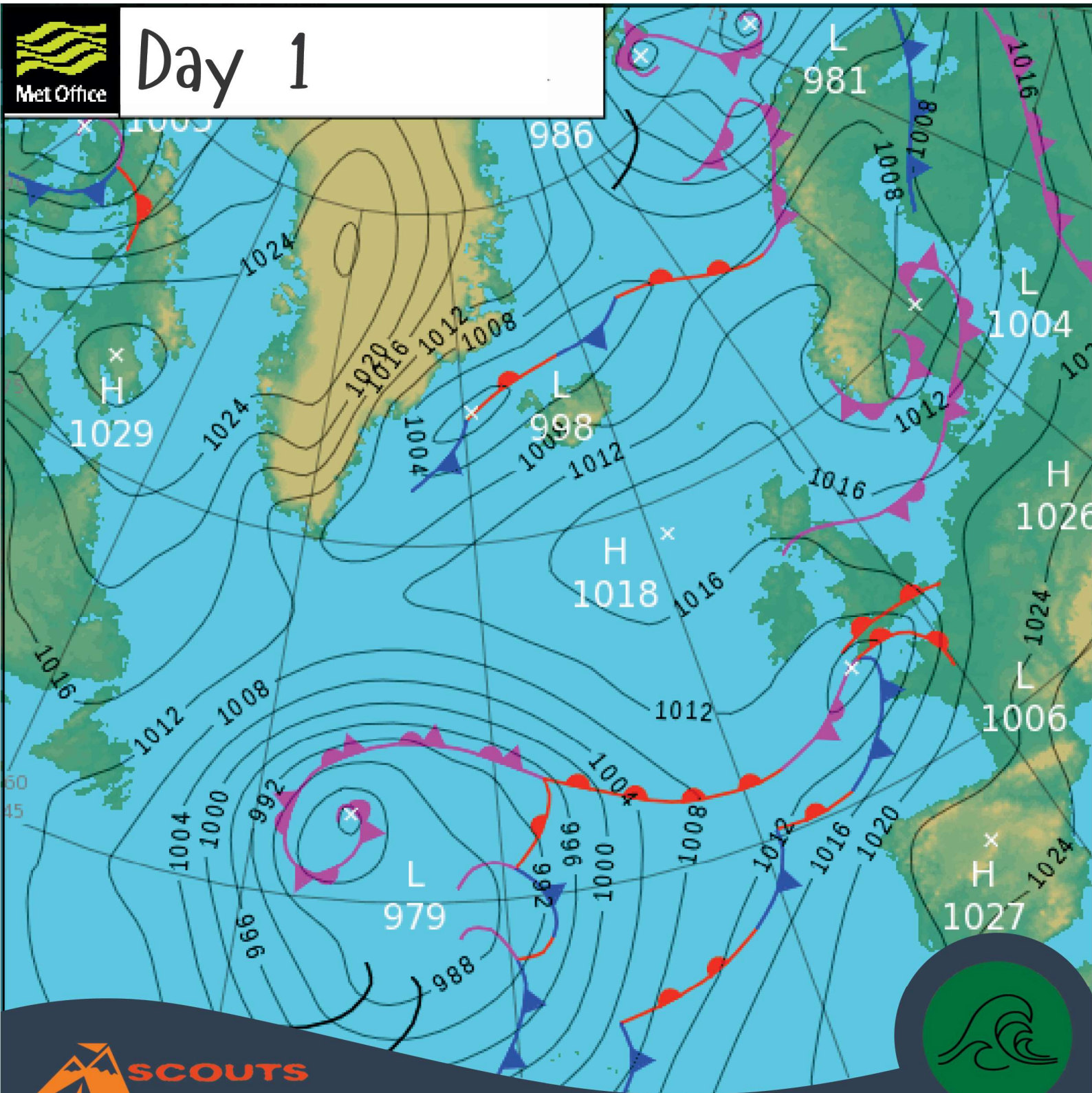
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CREATING YOUR FORECAST WEATHER TRACKING



Day 1

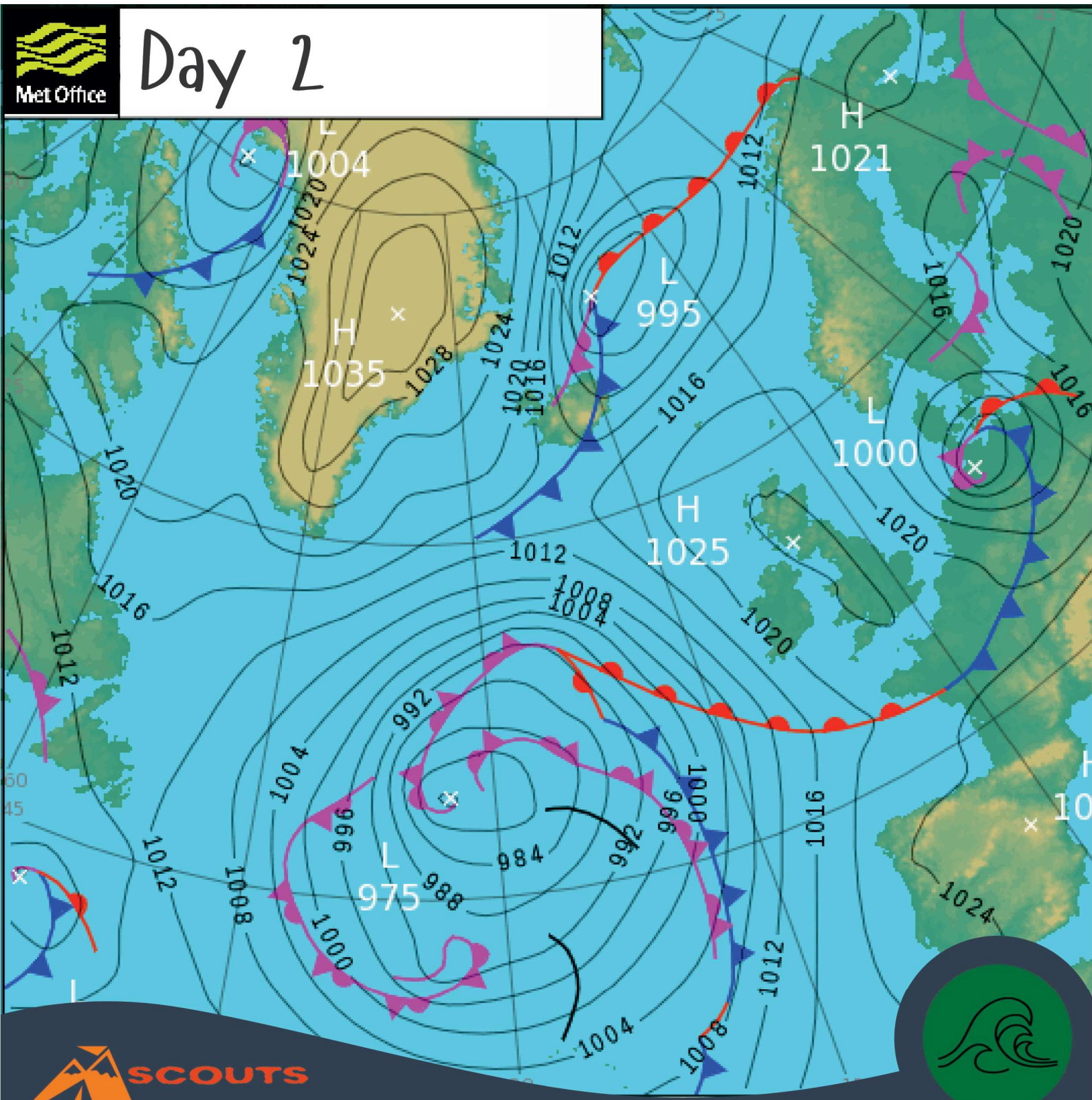




CREATING YOUR FORECAST WEATHER TRACKING



Day 2



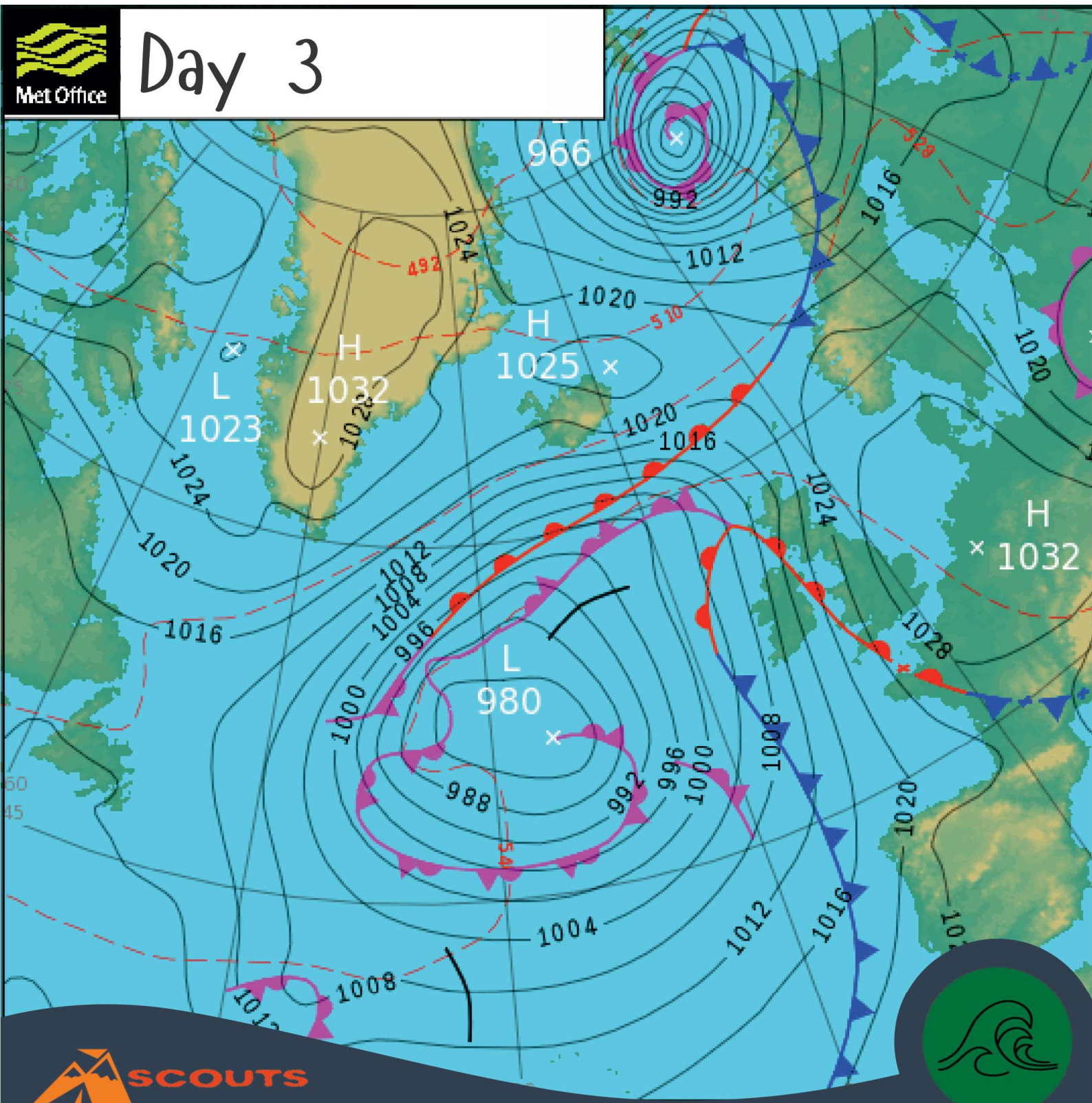


CREATING YOUR FORECAST WEATHER TRACKING



Met Office

Day 3



SCOUTS



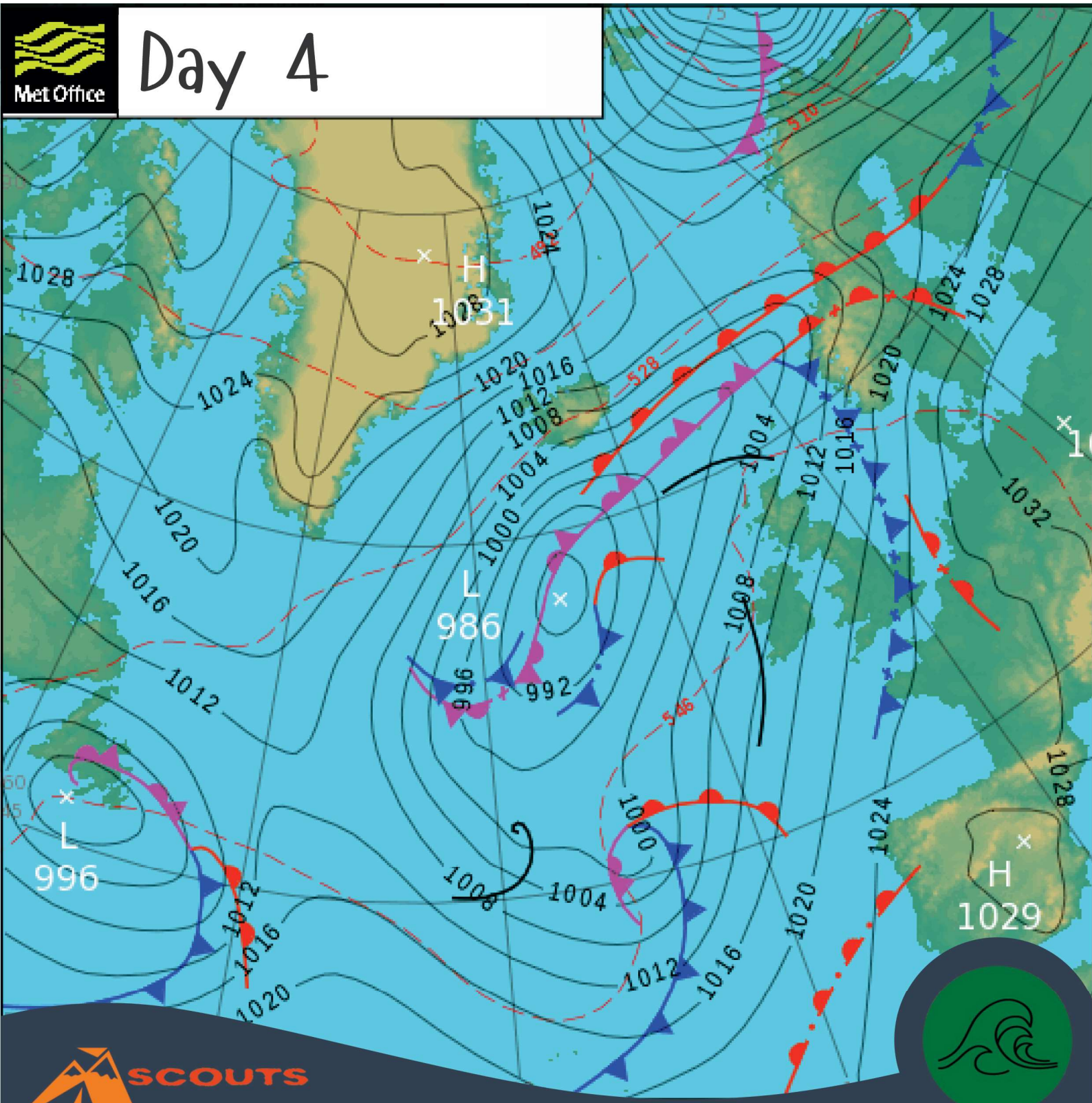


CREATING YOUR FORECAST WEATHER TRACKING



Met Office

Day 4



SCOUTS



ADVENTURES AFLOAT

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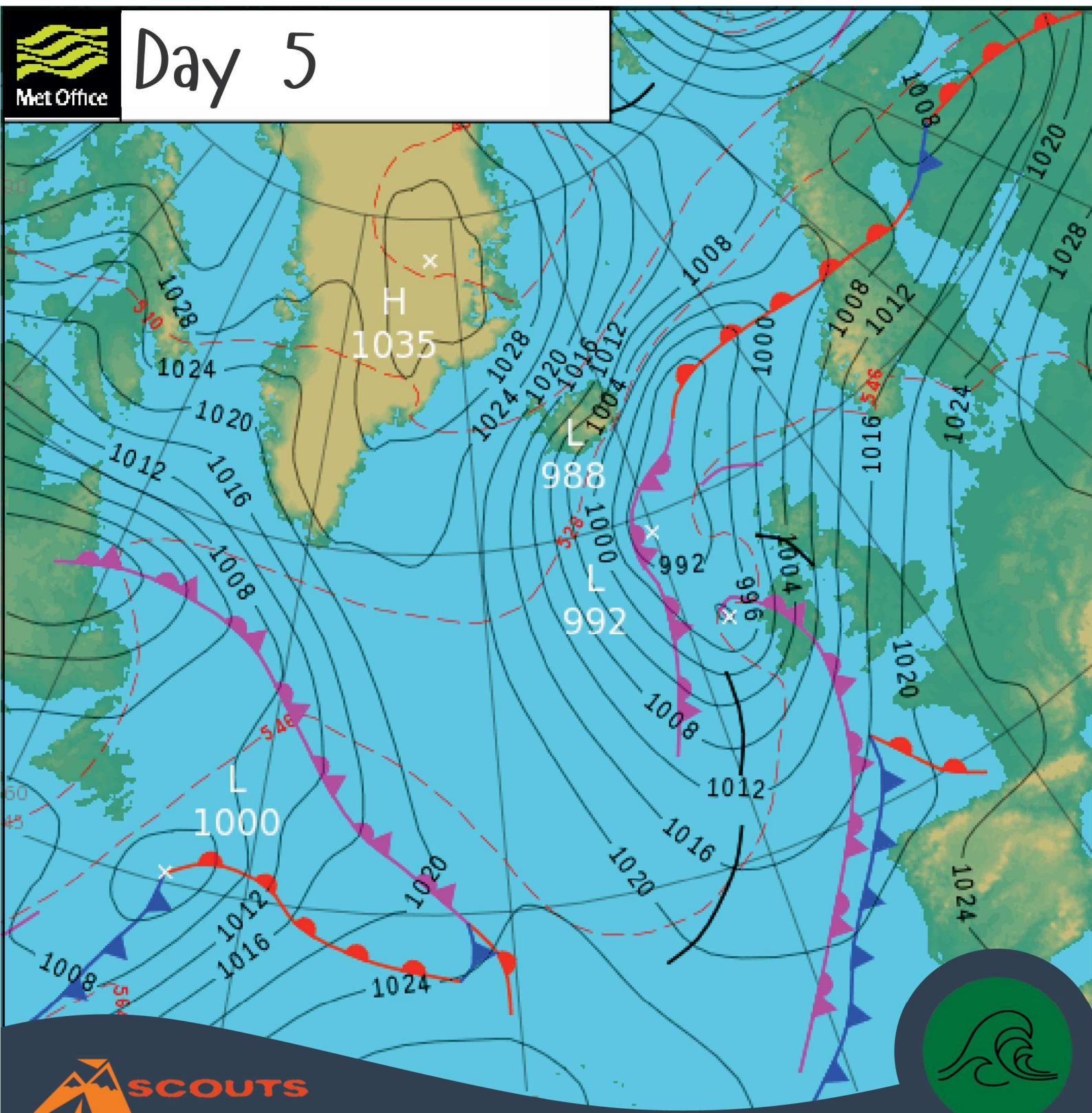
Scout
Helmsmans
Mate



CREATING YOUR FORECAST WEATHER TRACKING



Day 5





DISTRESS SIGNALS AFLOAT

When a vessel is in distress, there are a number of ways they can signal for help. This language is international so it is important for us to know should we ever get into trouble, but also so we can recognise the distress signal of others.

HAND FLARE

Bright red flare for short-range signalling. For day and night use. Duration: 1-2minute



COLLISION FLARE

Similar to hand flare but a white light. Illuminates an area for collision avoidance.

HAND SMOKE

Orange smoke for day use only. Duration: 3-4minute



PARACHUTE FLARE

Rocket for long-range use day or night. Shoots 300m into the air visible for miles. Duration: 30-40seconds



FLOATING SMOKE

Orange smoke for day use only in a can that is tossed into the water. Duration: up to 15minute



They all look fairly similar!

So it is important we know what we have before setting off!

Flares have expiry dates and are dangerous! They should be stored in a hard sealed container. Get familiar with their usage.



LED FLARES

Reusable and safe. These are becoming more popular.





DISTRESS SIGNALS AFLOAT

((SOS))

Originally developed for Morse Code, but now there are a number of methods...

Three Short (S)...

Three Long (O)---

Three Short (S)...

I Need Help!

Flashes, Claps,
Whistles, Yells...

S.O.S



VHF MARINE RADIO

Marine VHF radios are an essential communication tool for ensuring safety at sea.

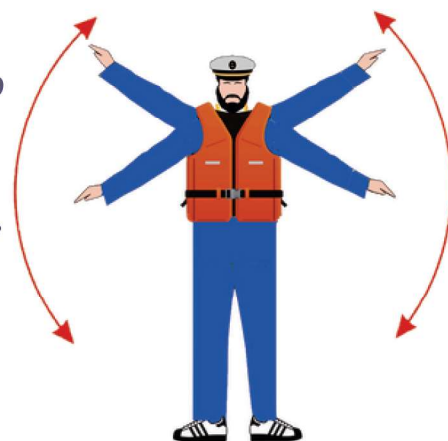
The airways are open so do some research on proper **Radio Etiquette**.

MAYDAY MAYDAY MAYDAY
PANPAN PANPAN PANPAN

Learn how to make these calls...

CH.12 - VTS
Ch.16 - Distress
Ch.67 - Safety Information

The oldest hand signal to indicate distress is to flap your arms up and down; slowly, not like a bird!



DISCUSSION GROUP

- What would be the most appropriate distress signal to use in different scenarios, such as a troop boating activity, a cruise ship, a small sailing yacht.
- Are all signals suitable at night?
- What precautions must be taken when using of flares?
- How do we safely dispose of an expired or spent flare?
- Research and practice correct radio etiquette in your Troop.



Can you identify this signal?



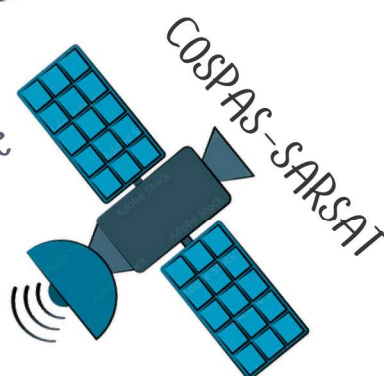
ADVENTURES AFLOAT

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Search & Rescue
Satellite



COSPAS-SARSAT

EPIRB

Emergency

Position

Indicating

Radio

Beacon

PLB

Personal

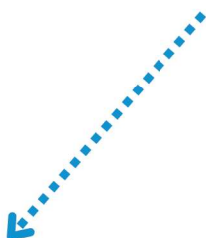
Locator

Beacon

406MHz



Rescue Coordination
Centre



KNOWING THE RISKS

A risk assessment is a process of checking for potential dangers in an activity, deciding how serious they are and finding ways how to make the activity safer. Being more aware of what might go wrong can significantly improve our experiences, prevent harm and help us achieve our goals.

A risk assessment should become second-nature and applied to everything we do. There are many formats but they all follow the same principle;

1. Identify Hazards

A possible source of harm.

This is generally something like the environment, an activity or a specific item.

- The Environment - Pier, Changing Room, Kitchen, Boat.
- Equipment - Ladder, Engine, Trailer, Saw.
- Activity - Refuelling, Launching, Swimming.

2. Evaluate the Risk

What can happen as a result of the hazard.

This is the potential incident that could occur.

- Slips & Falls
- Drowning
- Hypothermia
- Concussion
- Pollution
- Foot Injury
- Back Injury
- Cuts & Scrapes

Water-activities by their nature are conducted in a changeable dynamic environment.

We need to know the risks involved.



More guidance here in Scouting Ireland's Safety Afloat document.



3. Risk Rating

How likely is the risk going to happen and how dangerous could it be.
This is a useful measurement to then gauge how effective your control is.

- Low - Rare occurrence or minor injury (slips, trips, falls).
- Medium - Possible to happen and could cause injury (hitting head on boom).
- High - Likely to happen or cause serious harm (drowning, hypothermia).

4. Implement a Control

What can we do to make the activity safer and mitigate the risk?

- Introduce PPE (PFDs, shoes, helmets).
- Appropriate supervision and experience.
- Have emergency action plan available.
- Equipment inspected before launch.
- Each boat has a first-aid kit afloat.
- Swimming ability assessed.

Each Scout Group facilitating their own water-activities needs to develop their own Safety Afloat Toolbox.

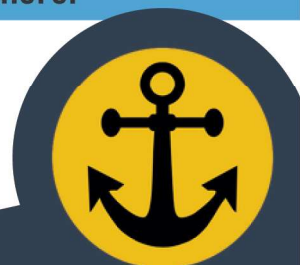
Risk assessments lead to Standard Operating Procedures which is a core element of Safety Afloat.

5. Review Risk Rating

With the control measure implemented, review the risk rating again.
Did it help reduce the likelihood or severity of the risk?
If not, implement another or a different control.

6. Record & Communicate

Write it down! Once you have completed your risk assessment, ensure it is dated and recorded.
If it is not written down, it didn't happen.
Ensure it is communicated to those who need it and not left on a shelf somewhere.





SAMPLE RISK ASSESSMENT

Hazard	Risk	Risk Rating	Control	New Rating
Slipway	Slips Trips Falls	M	Proper Footwear. Awareness to all users. Contact Council to clean.	L
On the Water	Drowning	H	PFDs for all boaters. Swim Test Completed. Qualified Supervision.	L
	Hypothermia	H	Proper gear worn. Weather assessed. Ability/ age assessed. Thermal Kit available.	L
Galley	Boiling Water	M	Supervision.	L
	Sharps	M	Stored securely.	L

More detailed risk assessments will split risk rating between likelihood and severity.

Risk Rating
H = High
M = Medium
L = Low





Scout Helmsmans Mate



RISK ASSESSMENT

Date _____

Completed by _____

Hazard	Risk	Risk Rating	Control	New Rating
 SCOUTS  Do a quick run around your Scout Den now and see if you can complete this risk assessment.				



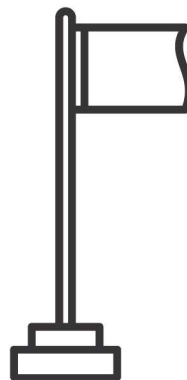
ADVENTURES AFLOAT

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MARITIME SKILLS NAUTICAL FLAGS



National Ensign

A National Flag at sea is called an Ensign. The Ensign of Ireland is the Tricolour.



Special Ensign

Some boating clubs and bodies have received special permissions to 'wear' a special ensign.

A Special ensign features the Ensign on the first quarter and the emblem of the club in the 4th quarter. Permission to deface and use the Irish Ensign in such a way may only be granted by the Chief Herald of Ireland, as per the Marine Shipping Act, 1955.

Scouting Ireland has been granted such a warrant.



Flag

This is the official flag of Scouting Ireland featuring the emblem and official emblem colours. The flag features a white fleur-de-lys with a green shamrock at its centre over a dark blue field.



Burgee

Typically a small triangular flag used to represent belonging to an organisation or club.

Clubs and bodies can create their own burgee design without the need of permissions from anyone.



Some individual burgees will be designed in a swallow-tail shape to identify when a senior member is onboard, for example this is the Sea Scouting Commissioners Burgee.

There may be other styles for a Commodore, Retired-Commodore, Fleet Captain or Race Champion.



Pennant

A triangular flag or long tapering flag primarily used as signal flags for nautical communications.

A numeral-pennant is used to represent numbers or a commissioning-pennant flown by naval vessels to indicate they are in active service.



Irish Naval Jack

Flown at the bow of Irish Naval Vessels at the Jack-Staff when at anchor, moored, alongside or when underway.



Flag Etiquette





NAUTICAL FLAGPOLE

Gaff

Is unique to a nautical flagpole and considered the position of honour.

Reserved for Ensigns/ Special Ensigns.

Masthead

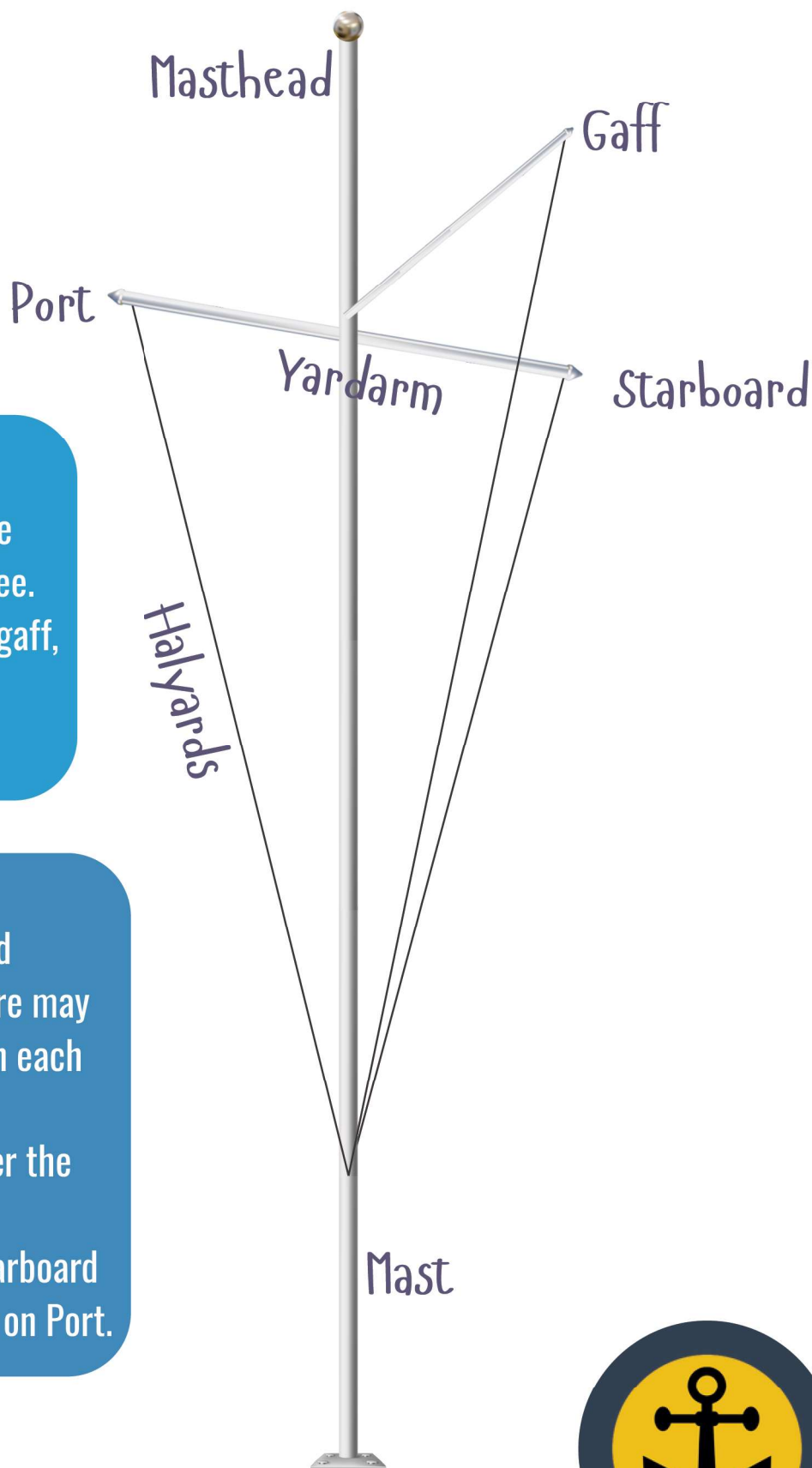
The next position of prominence and typically used for the Burgee. If the flagpole does not have a gaff, this is where the Ensign will be flown.

Yardarm

Horizontal crossbar with a Port and Starboard halyard. Sometimes there may also be inner and outer halyards on each side.

Starboard has a higher priority over the Port side.

A Group flag might be flown on Starboard while a Watch flag might be flown on Port.

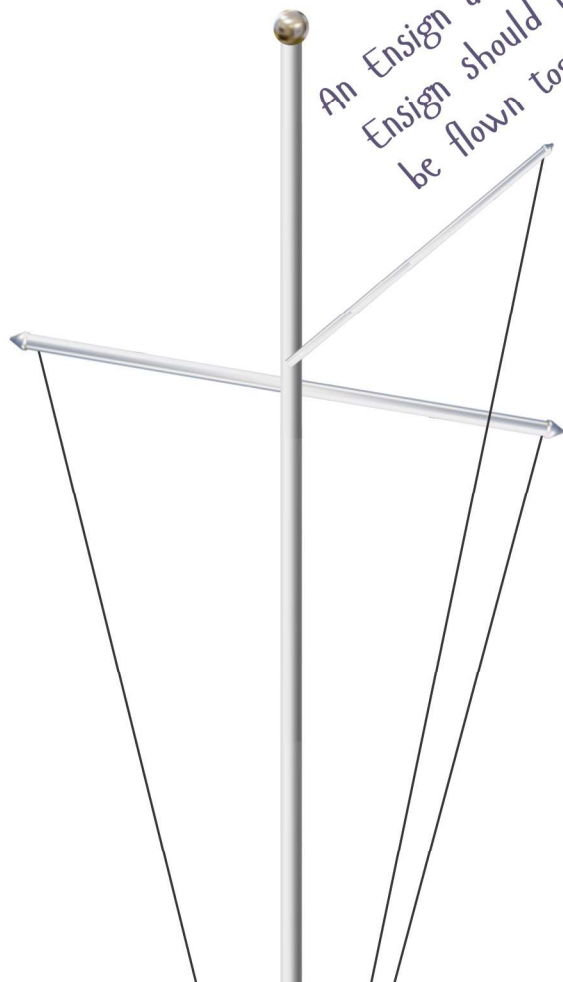




FLAG ETIQUETTE

Name each of the flag
types below;

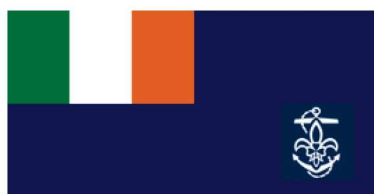
An Ensign and Special
Ensign should never
be flown together!



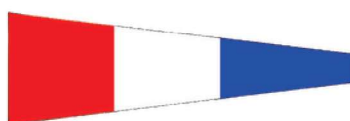
Number each flag point above, in the
priority in which they should be
hoisted.

- 1 = 1st Priority
- 2 = 2nd Priority
- 3 = 3rd Priority
- 4 = 4th Priority











What is a Courtesy flag
and where should it be
flown?





FOLDING A FLAG

When not in use, flags should be folded and put away.

This reinforces their symbolic importance and promotes care, tradition and responsibility. The usual method is to fold the flag into a reasonable small rectangle, and then roll her up. Another method is to do a triangular fold, in particular for National Ensigns.

Step 1 - Hold the Flag Steady

Two Scouts hold the flag horizontally by the edges, keeping it taut and flat.

Step 2 - Lengthwise Fold

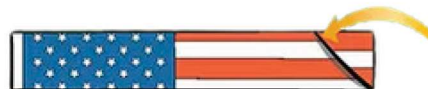
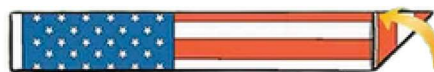
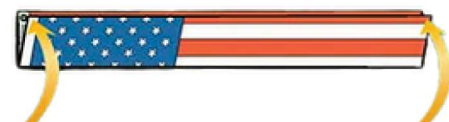
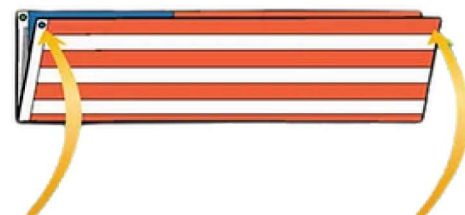
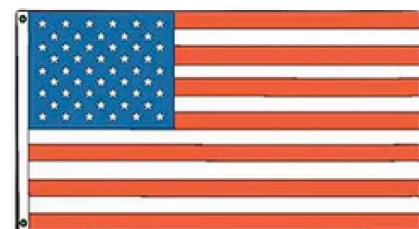
Fold the flag in half lengthwise, aligning the edges, with the open side facing up. Fold it again lengthwise so the open edge is hidden.

Step 3 - Triangular Folding

Start at the bottom right corner and fold the flag into a triangle by bringing the striped corner to the opposite edge. Continue making triangular folds until only a small section remains.

Step 4 - Tuck the End

Tuck the remaining edge neatly into the folds to secure the triangle.



To "Pass with flying colours" comes from old maritime tradition when ships successfully returned from a mission they would fly their colours (flags)!



HOIST THE COLOURS

Lots of Scout meetings, events and ceremony start and finish with the raising and lowering of a flag, or 'the colours' if you are a Sea Scout!

During a colours ceremony, the young people will stand in a horseshoe shape around a flagpole or the room, and one of them will raise the flag.

Typically a different scout will do this at each event. Flags will always be handled with great care, respect and responsibility due to their symbolic importance.

1. Secure the halyard to both ends of the flag.
2. Raise the flag in a smooth, swift action without pause until it reaches the top.

'Still' piped on the Boatswains Whistle as the flag is raised.
All should engage with a Scout Salute.

3. Secure the halyard to the cleat.

'Carry-on' piped on the Boatswains Whistle.



The term "half-mast" means to raise a flag to the halfway position on a flag pole. It's usually done as a mark of respect for the dead.

Scouts Own

An colour ceremony is a great opportunity to take a quiet moment to remind everyone of where they are and to get into the moment. A ceremony will mean different things to different people, but it's important to give everyone a personal chance to reflect at the start and end of each meeting.

If anyone feels comfortable, they should be encouraged to discuss anything that they might think about or reflect on in an opening or closing ceremony and why it's important to them.



Flags are normally
flown from
sunrise to sunset





ROPE WHIPPING - WEST COUNTRY

The West Country Whipping must be the easiest whipping to learn. It's essentially a series of Half-Knots, completed with a Reef Knot!



1
Pass the whipping twine around the rope and tie a Half-Knot.



2
Repeat the process on the back of the rope.



3
Do it again on the front.



4
Do it again, and again, and again!



5
Finish with a Reef Knot to secure.



ANIMATED
KNOTS™

Keep going until the whipping equals the approx diameter of your rope.



ROPE WHIPPING - COMMON

The Common Whipping is the classic and simple whipping.

With a little practice, and the appropriate size of whipping twine, it creates a very neat appearance with no visible ends



1



Lay the whipping
twine against your
rope

2



wrap the long end around the rope about
8 times.

3



4



Make a bight in the
short end.

5



Wrap the long end about 8
more times around both the
rope and the bight.

6



On the final turn pass the
long end through the bight.
Pull the short end tight to
hide the bight and done!



ANIMATED
KNOTS™





ROPE WHIPPING - SAILMAKERS



The Sailmaker's Whipping is certainly the most secure whipping, and so arguably a little more tedious than the rest.

The whipping turns are contained by frapping that both grip the rope and prevent the whipping from unwinding if damaged.

1

Thread the whipping twine between the strands.

2

Wrap the long end around the rope a couple of times.

3

Pass the twine back through the strands, down a grove to start frapping.

4

Continue frapping between the twine and the strands.

5

Secure the two ends with a reef knot to complete.

6



ANIMATED
KNOTS™





MARITIME SKILLS CONSERVATION CAMPAIGN

Using the power of photography to protect our oceans; Marine Life, Litter or Landscapes
Sometimes a picture does say a thousand words, take a photo to;

- Raise awareness of marine conservation issues.
- Inspire action by showcasing the beauty of the marine environment.
- Document and share the impact of marine litter on ecosystems.



Marine Life:

- Wildlife in its natural habitat.
- The beauty of biodiversity.



Marine Litter:

- Highlight litter in the ocean, on beaches, or impacting marine life.
- Show the scale of pollution.

Landscapes:

- Contrast pristine marine landscapes with polluted areas.
- Capture unique features of local coastal environments.

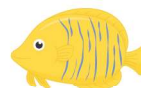


Technical Tips:

- Use natural light, especially during "golden hour" (sunrise and sunset).
- Focus on Composition - Rule of thirds, leading lines, and framing.
- Get Creative - Experiment with macro shots of litter or marine life.



Do not disturb wildlife
or their habitats.



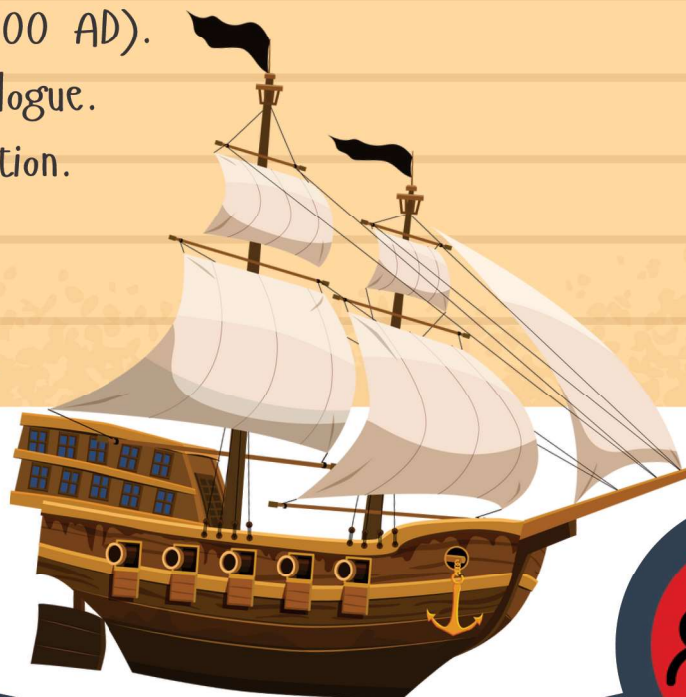


CONNECTING WITH THE MARINE RESEARCH A HISTORIC VOYAGE

Research a famous sea voyage to uncover a story of adventure and discovery. Plot the route on a map and share it with your Troop, highlighting the challenges sailors faced, the discoveries they made and the impact their journey had on the world!

Here are some examples of famous sea voyages to help get you started!...

1. Voyage of the Mayflower - Pilgrims' journey to America in 1620.
2. Captain Cook's First Voyage - Mapping the Pacific, Australia, and New Zealand in 1768.
3. Magellan's Circumnavigation - First voyage around the world (1519-1522).
4. HMS Beagle and Charles Darwin - Exploring S. America and the Galápagos Islands in 1831.
5. Viking Explorations - Early Norse voyages to Greenland and North America (c. 1000 AD).
6. The passages of the MV Kerlogue.
7. Ellen McArthur's circumnavigation.
8. Voyages of Ibn Battuta.
9. Voyages of Zheng He.
10. Polar voyages of Shackleton.





CONNECTING WITH THE MARINE RESEARCH A HISTORIC VOYAGE

Step 1 - Choose a Voyage

This can be undertaken as a group project.



Step 2 - Research

- Timeline - When did the journey take place? How long did it take?
- Route - What was the route and plot this on a map.
- Goals - Why was the voyage undertaken and did they discover anything?
- Challenges - What difficulties did they face; storms, illnesses?
- Key figures - Who were the notable leaders or crew members?

Step 3 - Ideas to Display

- Map the Journey - Draw a map showing the starting point, route and final destination. Mark interesting points along the way.
- Timeline Strip - Create a timeline along the edge of the display showing significant events during the voyage.
- Fact Cards - Write short facts about the voyage, key figures, or challenges they faced.
- Mini Diorama or Model Ship - Craft a small model of the ship or a scene from the voyage.
- Explorer Profiles - Draw or print out pictures and add descriptions for important figures.

Step 4 - Present to the Troop

If undertaken as a group or watch/patrol project, ensure all members of the team has a part to play.





Scout
Helmsmans
Mate



CONNECTING WITH THE MARINE HOST A LAYING-UP SUPPER

A Laying-Up Supper is an old maritime tradition, celebrating and reflecting on the achievements and successes of the years activities.

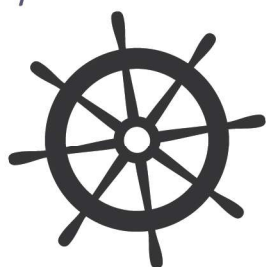
It gives everyone a chance to come together and celebrate the hard work, learning and fun they've put in over a good meal!

The supper is a way to "Lay-Up" your own adventures, sharing memories, saying thanks and recognising achievements before looking ahead to the next season.

"Laying Up" refers to the process of preparing boats for the offseason. It typically happens at the end of the boating season when the weather becomes too harsh for regular activity afloat.

It symbolises a moment of rest, reflection and preparation, for you and your boats! and a formal conclusion to the season.

Organise a hot meal at the Scout Den for your Group or Troop with invited guests and Scouters who helped make your year a success.



Involve Everyone Ask everyone to help plan or contribute, whether it's bringing food, making decorations or preparing a speech and slideshow.

Keep it Fun This is a celebration, so keep the atmosphere light-hearted and enjoyable for all.

Make it Memorable Photos, presentations and a group photo can be great ways to remember the event.

Enjoy the celebration, your hardwork deserves to be recognised in style! ⚓





HOSTING A LAYING-UP SUPPER

1. Set the Date & Venue

Pick a date towards the end of the season.
Choose a suitable location and start thinking what external friends should be invited.

2. Plan the Menu

Make your own or bring in a buffet caterer?
Design a budget and send out an RSVP.
Make sure there's enough food for everyone and consider dietary requirements.

3. Prepare Awards & Thank-Yous

Take the opportunity to say thanks; Scouters for giving up their weekends, parents for towbars and carpools, we can't do it alone!
Consider some silly awards too!...

- Pirate in Training Award
- Captain of Chaos Award
- First Mate of Fun Award
- Captain of Good Vibes Award

4. Organise some Speeches & Slideshows

Encourage sharing of good activities and memories from throughout the year.
A rolling background slideshow and some presentations on specific events.

5. Decorations & Atmosphere

Nautical-themed decorations and colours are great! (signal flags, ropes, netting, life rings). Perhaps some tablecloth, table names, dim lighting, fairy lights and table centre-pieces.
Did someone say Sea Shanty!

6. Host the Event

Ensure everyone feels welcome and relaxed.
Host registration at the door, and take entry fee if required. Will there be a tableplan?
Stick to the schedule but keep things flexible and fun.
After the supper, make sure everyone helps clean up and don't forget to get a group photo!

1700 Setup
1900 Guest Arrive
1915 Welcome Address + Start Foods
2000 Troop Presentation
2020 Table Quiz + Dessert
2045 Activity Presentations
2100 Awards & Thank-You Certificates
2120 Group Photo
2130 Conclude

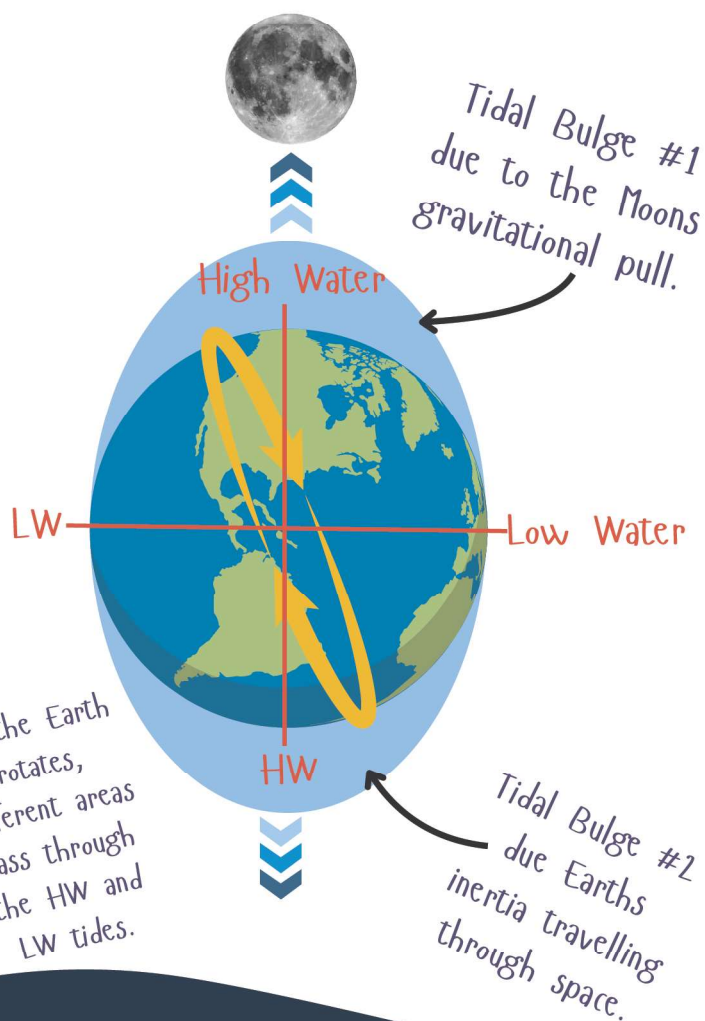


TIDAL TALES

Tides are the regular and reliable rise and fall of sea. In Ireland, we get two High-Tides and two Low-Tides each day, approximately every 6-hours.

Armed with this information, we can better prepare for our activities by predicting safer water levels for adventure and direction of tidal currents.

Caused by the gravitational pull of the Moon and the Sun, as well as the Earth's rotation. Tides are predictable and follow a regular cycle that is important for navigation, fishing and planning coastal activities.



Tide Tables give us the calculated prediction of High and Low water times and heights for a specific location and date.

July	DUBLIN PORT	
11	02:47	4.4m
SAT	08:56	1.3m
	15:18	4.3m
	21:17	1.3m

This is the typical tide table information for a specific date.

Where could I get the Tide Tables for my local area?





TIDE TABLES

Moon Phases



Full Moon

New Moon

1st Quarter Moon

3rd Quarter Moon

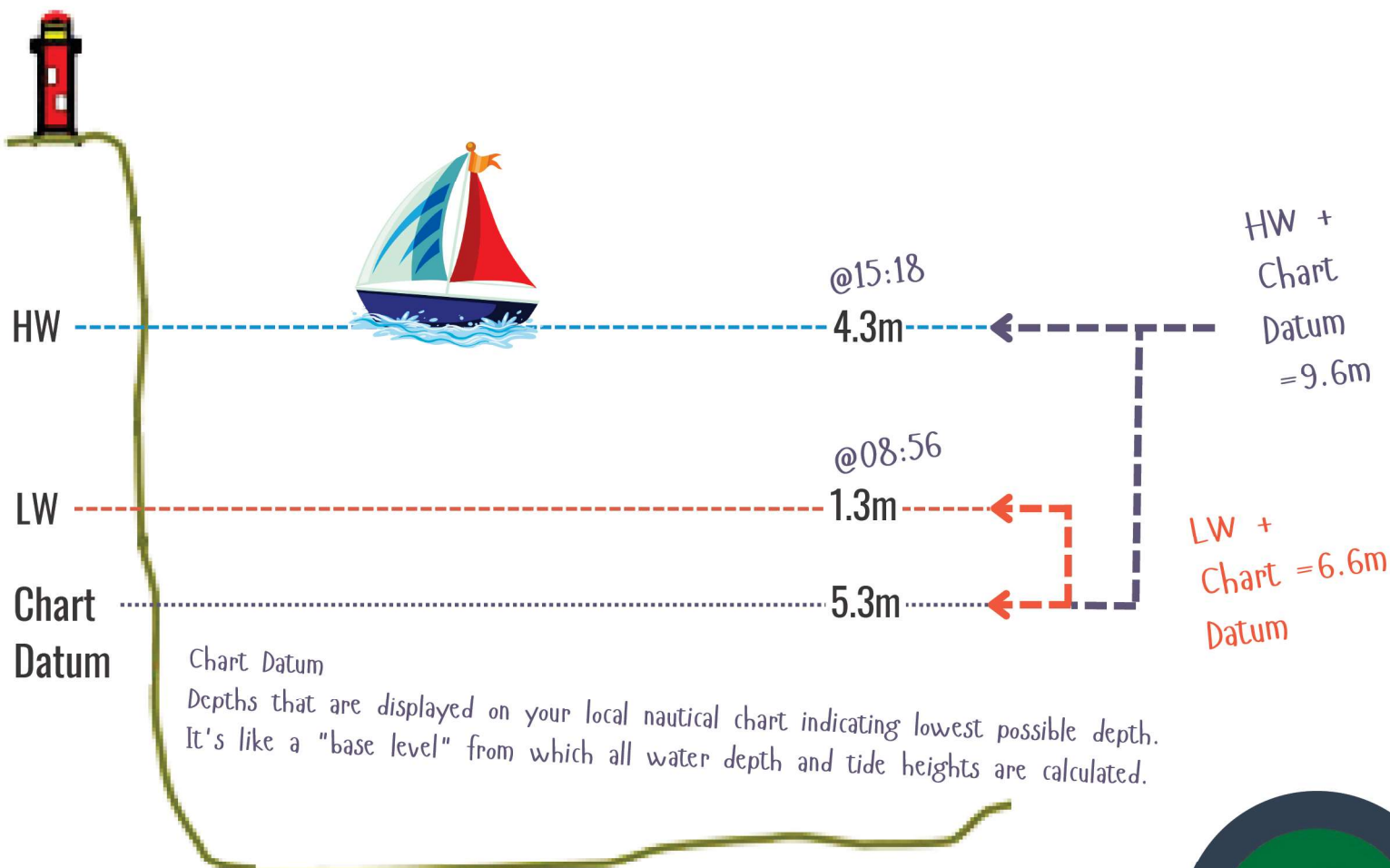


If one of these symbols accompany your tide table date, additional consideration may be needed!...

Date	Location
July 11 SAT	DUBLIN PORT
02:47	4.4m
08:56	1.3m
15:18	4.3m
21:17	1.3m

From these heights, we can make assumption as to which is HW and which is LW.

Tide Times
Tide Heights

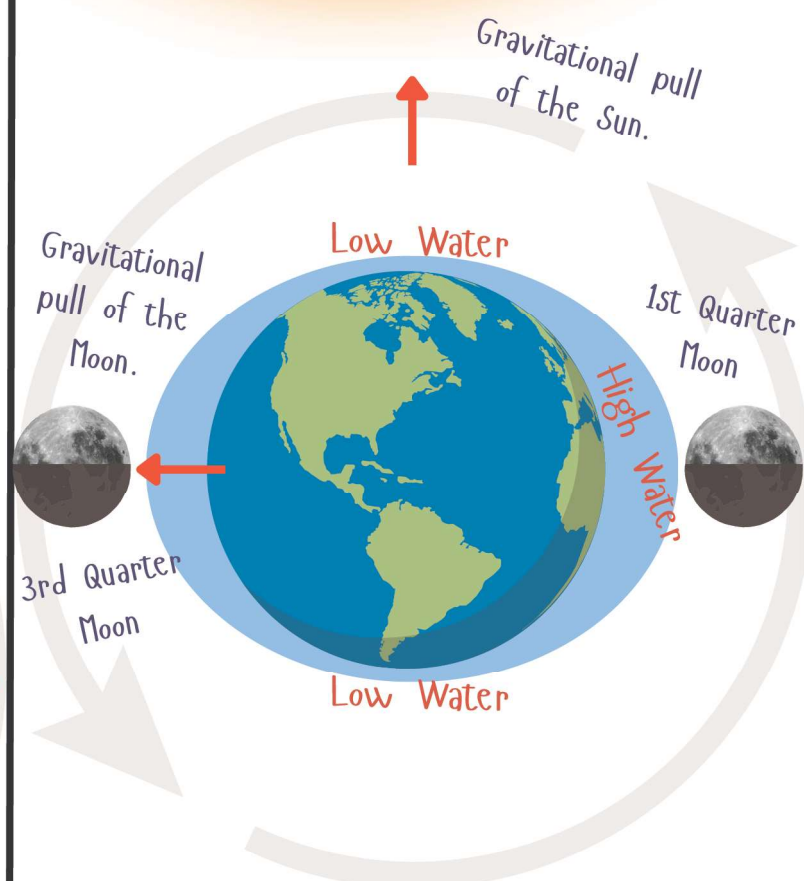
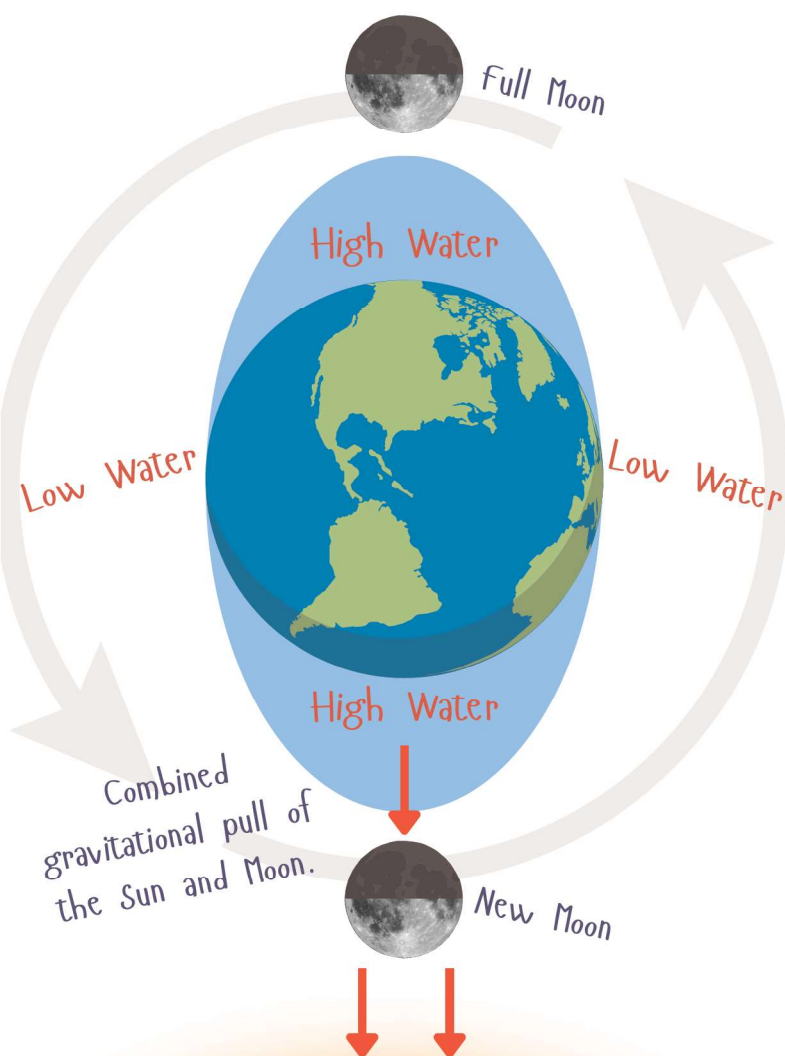




TIDAL TALES

SPRING TIDE

A Spring Tide happens when the Sun, Moon and Earth are aligned. This alignment creates the strongest gravitational pull, resulting in higher high-tides and lower low-tides than usual.



A Neap Tide occurs when the Sun and Moon are at right angles to each other. This weaker gravitational pull results in lower high tides and higher low tides, so the difference between them is smaller.

NEAP TIDE





TIDAL ATLAS

A Tidal Stream Atlas predicts the SET and RATE of the tide during a particular hour.

→ Strong current

→ Weaker current

2.0 Knots
(Neap)

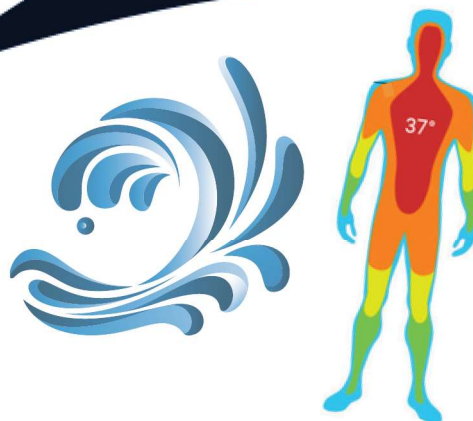
RATE = SPEED

20,35

3.5 Knots
(Spring)



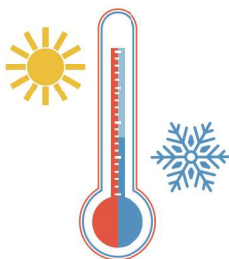
OCEANOGRAPHY AIR & WATER TEMPERATURE



Staying comfortable and warm on the water - and for how long you can maintain this - is a huge factor for consideration when engaged with water-activities in Ireland. Once we start getting cold afloat, our time is numbered.

Air Temperature

The measure of how warm or cold the atmosphere is. It changes quickly with time of day, weather and location.



Water Temperature

The measure of how warm or cold a body of water is. It changes more slowly due to water's ability to hold heat longer.

Key Differences

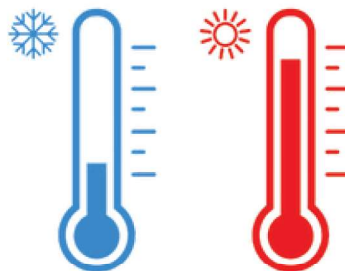
- Water conducts heat away from the body 25x faster than air at the same temperature, making cold water much more dangerous.
- A 10°C air temperature might feel brisk, but 10°C water can cause hypothermia in minutes!

Windchill refers to how much colder it feels when the wind blows across your skin, taking away heat faster.

Higher wind speeds can make it feel much colder than the actual air temperature.

If the air temperature is 10°C but the wind is blowing at 30 km/h, it can feel like it's only 0°C.



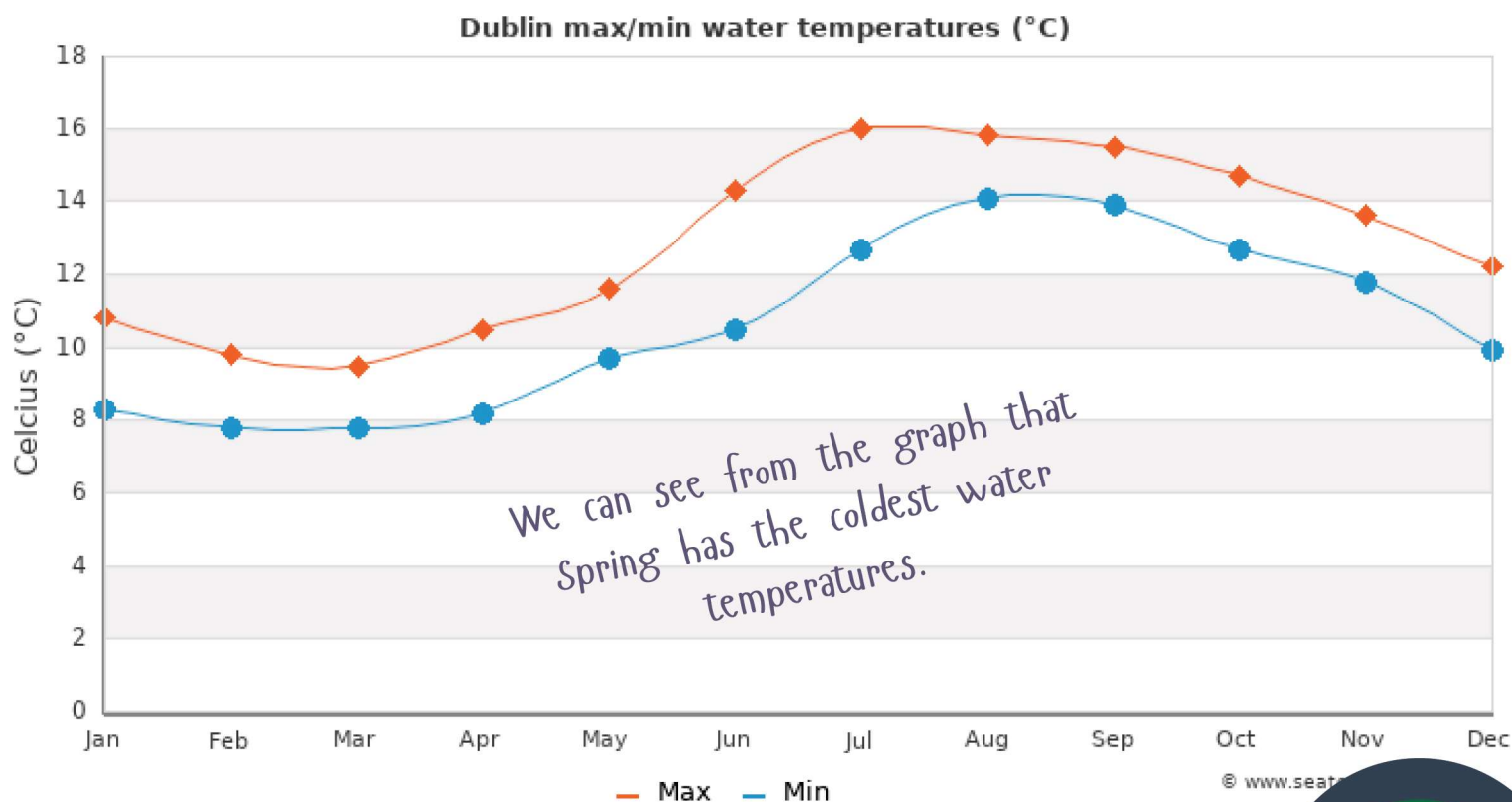


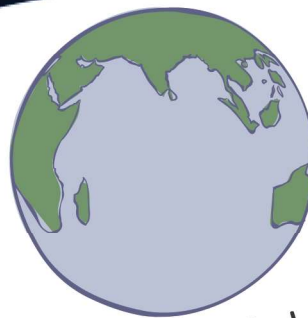
AIR & WATER TEMPERATURE DIY EXPERIMENTS

1. Air vs Water Heat Loss

Discover how much faster water takes heat away from objects compared to air.

- Kit List: x2 small glasses, thermometer, hot water, ice, large bowl.
- Step 1 - Fill two glasses with hot water (around 40°C, not boiling) and place one glass into a bowl of ice-water and the other on a table in room temperature.
- Step 2 - Measure the starting temperature of both glasses.
- Step 3 - Check temperature every 2 minutes and record how fast each cools.





71% of the
Globe's surface is
Water!

OCEANOGRAPHY FRESHWATER VS SALTWATER

All our boating activities take place on a waterbody;
chances are this will be on **Freshwater** or **Saltwater**!

FRESH	Key Characteristics	SALT
Rivers, Lakes, Streams	Source	Oceans & Seas
Very low <0.05%	Salinity	~3.5% (don't drink!)
Low (harder to float)	Buoyancy	High (easy to float)
0° C	Freezing Point	-2° C
Low	Conductivity	High
3% of Earth's Water drinkable	Distribution	97% of Earth's Water non-drinkable

FRESHWATER VS SALTWATER DIY EXPERIMENTS



1. Buoyancy

- Kit List: x2 clear glasses, x2 eggs, water, salt.
- Step 1 - Fill one glass with freshwater and the other with saltwater (add x6 tablespoons of salt/ 500ml).
- Step 2 - Place an egg in each water container and observe.

Saltwater has a higher density, which provides more buoyant force, helping things float.

2. Freezing

- Kit List: x2 small plastic cups, water, salt, freezer.
- Step 1 - Fill one cup with freshwater and the other with saltwater (add x6 tablespoons of salt/ 500ml).
- Step 2 - Place both cups in the freezer and take note of the icing formation after 1-hour.

Depending on your type of freezer, you may decide to check at 30-min intervals.

Salts interfere with ice forming crystals so lowers the freezing point to around -2°C .

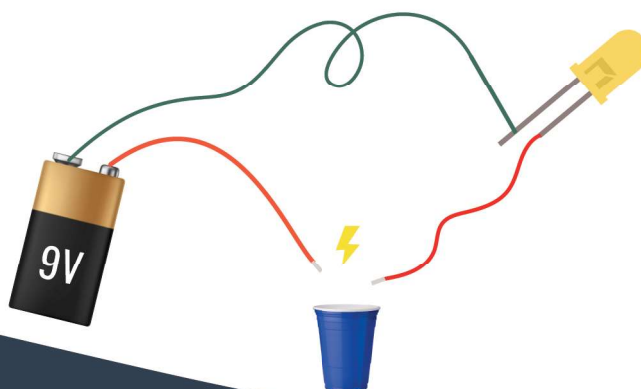


3. Electrical Conductivity

- Kit List: 9V battery, LED, wires, x2 cups, water, salt.
- Step 1 - Fill one cup with freshwater and the other with saltwater (add x6 tablespoons of salt/ 500ml).
- Step 2 - Make a simple circuit as below with LED and small battery.
- Step 3 - Dip the open-ended wires into a cup of saltwater and separately, a cup of freshwater.

Don't allow the wires to touch. Observe your results.

Saltwater conducts electricity better because of the dissolved ions in the water.



FRESHWATER VS SALTWATER DIY EXPERIMENTS



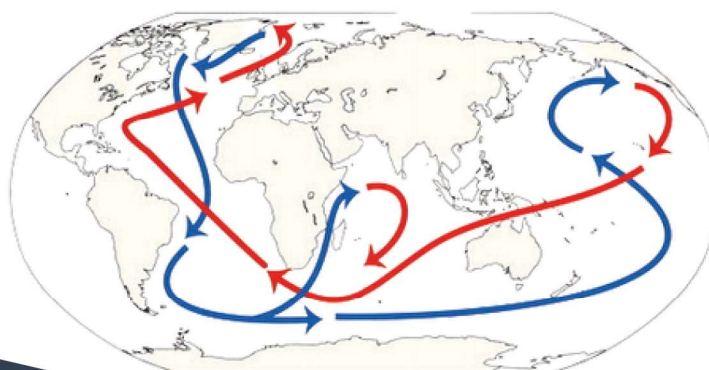
4. Evaporation and Salt Crystals

- Kit List: x2 shallow dishes, water, salt, magnifying glass.
- Step 1 - Pour a sample amount of saltwater and freshwater onto separate dishes and give it a few days to evaporate. You could escalate this process by using a hob and appropriate dish or leaving the samples out in the sun.
- Step 2 - Examine both samples when the water has fully evaporated. A magnifying glass can be a useful tool here.

No residue should be left behind in the freshwater dish while salt doesn't evaporate so salt crystals will be left behind.

5. Salinity and Ocean Currents

- Kit List: A clear container, cold saltwater (dyed blue), warm freshwater (dyed red).
- Step 1 - Half-fill a clear container of room temperature tap water.
- Step 2 - **Slowly** pour the (blue) cold saltwater into one end of the container.
The cold saltwater should sink and flow outward, simulating dense cold ocean currents.
- Step 3 - **Slowly** add the (red) warm freshwater to the other end of the container.
This warmer water should float on the surface and spread across the container.
A dropper can be a useful tool to slowly add the different waters.
Salinity and temperature differences drive ocean currents, critical for marine life and climate.





OCEANOGRAPHY DIRTY WATER FILTRATION

Clean water is essential for health, hydration, hygiene and life.

Understanding water filtration can teach us about water quality, pollution and how ecosystems remain healthy.

Scouts may also face situations where clean water isn't readily available, knowing basic filtration techniques can be life-saving.

KEY CONCEPTS IN WATER FILTRATION

1. Separation of Solids

Filtration removes large particles like sand, dirt or organic debris from water.

2. Absorption of Impurities

Many harmful substances in polluted water are invisible. Materials like activated charcoal can absorb and trap toxins and chemicals from the water.

3. Desalination

A process that separates salt from seawater, making it drinkable for humans and usable in agriculture.

4. The Role of Nature

Filter feeders like oysters and mussels play a key role in cleaning water naturally. Wetlands are excellent at capturing sediments and absorbing nutrients and pollutants.





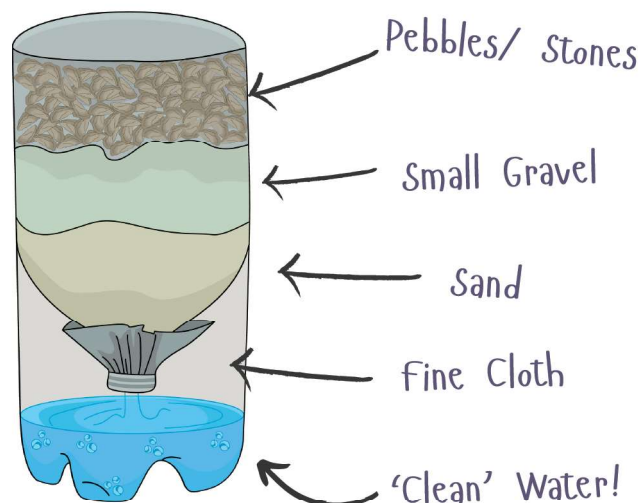
DIRTY WATER FILTRATION DIY EXPERIMENTS

1. Build a DIY Water Filter

Understanding how layers of materials can filter out impurities.

Kit List

- 2-litre plastic bottle.
- Coffee filter paper or fine cloth.
- Gravel or small stones.
- Sand.
- Dirty water (mixed soil & leaves).



Step 1 - Setup your Filter

- Cut the 2-litre bottle in-half, secure the filter paper/ fine cloth to the neck of the bottle and invert this end into the bottom section of the bottle.
- Layer finer materials such as sand into the bottle then smaller gravel and stones.

Step 2 - Pour the Dirty Water

- Slowly pour the dirty water into the top of the bottle.
- Watch the water pass through the layers. The gravel catches large particles and sand removes the finer debris.

Step 3 - Collect and Compare

- Compare the filtered water to the original dirty water. Discuss how effective the filter was and what could be done to improve it.



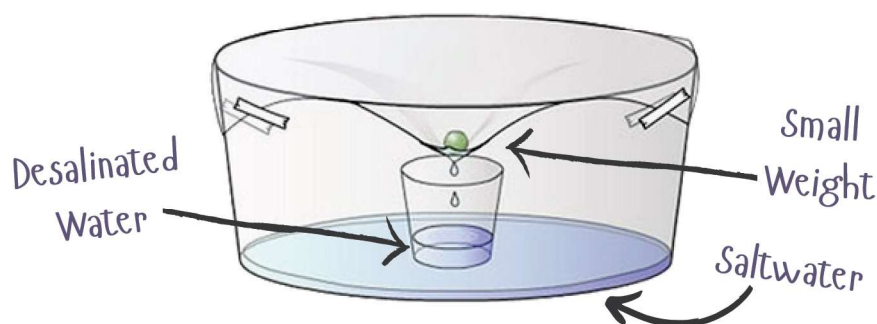
DIRTY WATER FILTRATION DIY EXPERIMENTS

2. Desalination Experiment

Salt can be removed from water through evaporation and condensation making it drinkable.

Kit List

- A large bowl.
- A smaller glass or jar.
- Clingfilm.
- Saltwater.
- A small stone or weight.
- Sunlight or a heat source.



Step 1 - Set Up the Experiment

- Pour the saltwater into the large bowl.
- Place the smaller jar (empty) in the center of the bowl.
- Cover the bowl tightly with clingfilm and place a small stone over the opening of the jar, creating a small dip.

Step 2 - Evaporation & Condensation

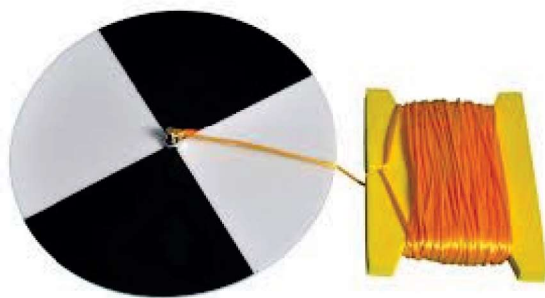
- Place the experiment in sunlight or near a heat source. As the water evaporates, it condenses on the clingfilm and drips into the smaller jar, leaving the salt in the bowl behind.

Step 3 - Collect Freshwater

- After a few hours, check the jar. It will contain desalinated water.
- This demonstrates the principals behind thermal desalination to purify water.

Desalination provides lifesaving drinking water for millions of people worldwide, particularly in arid regions.

OCEANOGRAPHY SECCHI DISK



Water transparency refers to how clear or murky a body of water is, determined by how deep light can penetrate. Transparency is crucial for marine ecosystems, as clear water allows sunlight to support photosynthesis in plants and algae, which is the foundation of life in all our waters.

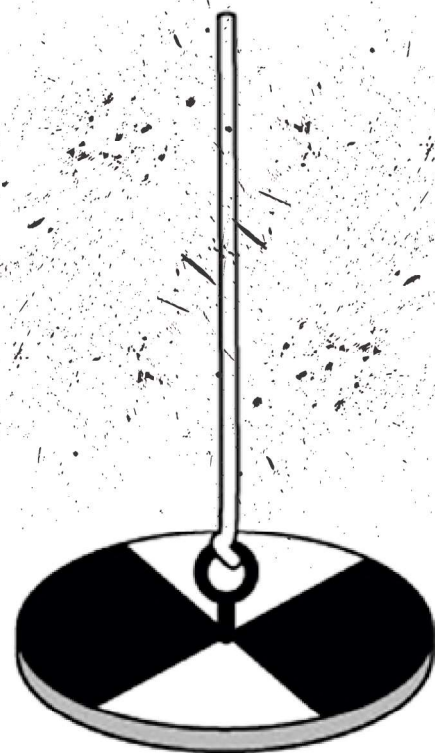
Murky water can indicate pollution, excess nutrients or algae blooms limiting water quality and life below the surface.

A **Secchi Disk** is a simple but effective tool used by oceanographers to measure water clarity. It helps monitor changes in water quality and detect environmental issues.

It consists of a round, weighted disk with alternating black and white quadrants. It is lowered into the water until it is no longer visible and the depth is recorded.

Make your own Secchi Disk, record the water depth at which it is no longer visible and the date.
Is the water transparency in your waters changing?
What could be a contributing factor for this?

WHAT'S IN THE WATER



Secchi
Disk
Experiments



YOUR BOATING WATERS

The Seas, Lakes, Rivers and Puddles around Ireland are our playground and like most playgrounds, every one is different!

Understanding your local Boating Waters helps keep you safe and enjoy your time afloat, while avoiding unexpected dangers.

WHAT TO LOOK OUT FOR

Every waterbody has its own unique challenges and characteristics. Here are some common things to look out for;

1. **Strong Currents & Tides** can pull you into more dangerous areas.
2. **Depth** sudden drop-offs or shallows you can get grounded on.
3. **Underwater Obstacles** like rocks and debris can cause injury.
4. **Marine Life** can pose a threat if disturbed. Be mindful & respectful.
5. **Access Points** are essential for safe entry and exit.

In Scouting Ireland, all our activity waters must be assessed and fit into our Classification of Boating Waters characteristics.

More guidance on this can be found in the **Safety Afloat** document or by contacting the Sea Scouting Team, who are responsible for supporting safe access and advice to the water.

seascouting@scouts.ie





CLASSIFICATION OF WATERS



Scout
Helmsman

Scouting Ireland's Boating Waters are divided into five categories. Each classification presents different characteristics, hazards, difficulty and opportunity for activity, which is reflected in the different levels of Certificate of Competence that are required to supervise Scouting activities afloat.

TYPE OF WATERS	INTENDED USE	DESCRIPTION	GEOGRAPHICAL LIMITS
Safe Enclosed Waters	Basic instruction and practice. Normal Scout Activity.	Sheltered inland where there are no or minimal currents or tide, such as protected harbours, estuaries, rivers, canals and small lakes.	Limits are proposed by each Scout Group and submitted to the Sea Scouting Team for consideration and approval. Sheltered, shallow and immediate access to the shore.
Restricted Waters	More-advanced instruction, practice and activity.	Water often affected by tide or current but excluding dangerous inshore waters eg. tidal race or overfalls. Most inland lakes and waterways fall into this category.	Limits are proposed by each Scout Group in consultation with the local experts and submitted to the Sea Scouting Team for approval. Generally, exposed waters within 3nm offshore.
Day Cruising Waters	Day passage & Expedition.	The sea.	The sea, within 5nm from shore, and up to 15nm along the coast from the Scout Group's normal operating base.
Coastal Waters	Expedition.	The sea.	The sea, up to 10nm offshore.
Offshore Waters	Expedition.	The sea, on passage out of sight of land.	None.

My to do...

1. Identify the potential hazards in my local waters.
2. Create a map to display in my Den to best communicate these hazards.
3. Review the Safety Afloat document to ensure my waters are appropriate.
4. Register my local waters if they are not recorded already.



ADVENTURES AFLOAT

#ScoutingIrelandOnTheWater



**Scout
Helmsman**

Waterways Ireland
Uiscebhéalai Éireann Watterweys Airlann

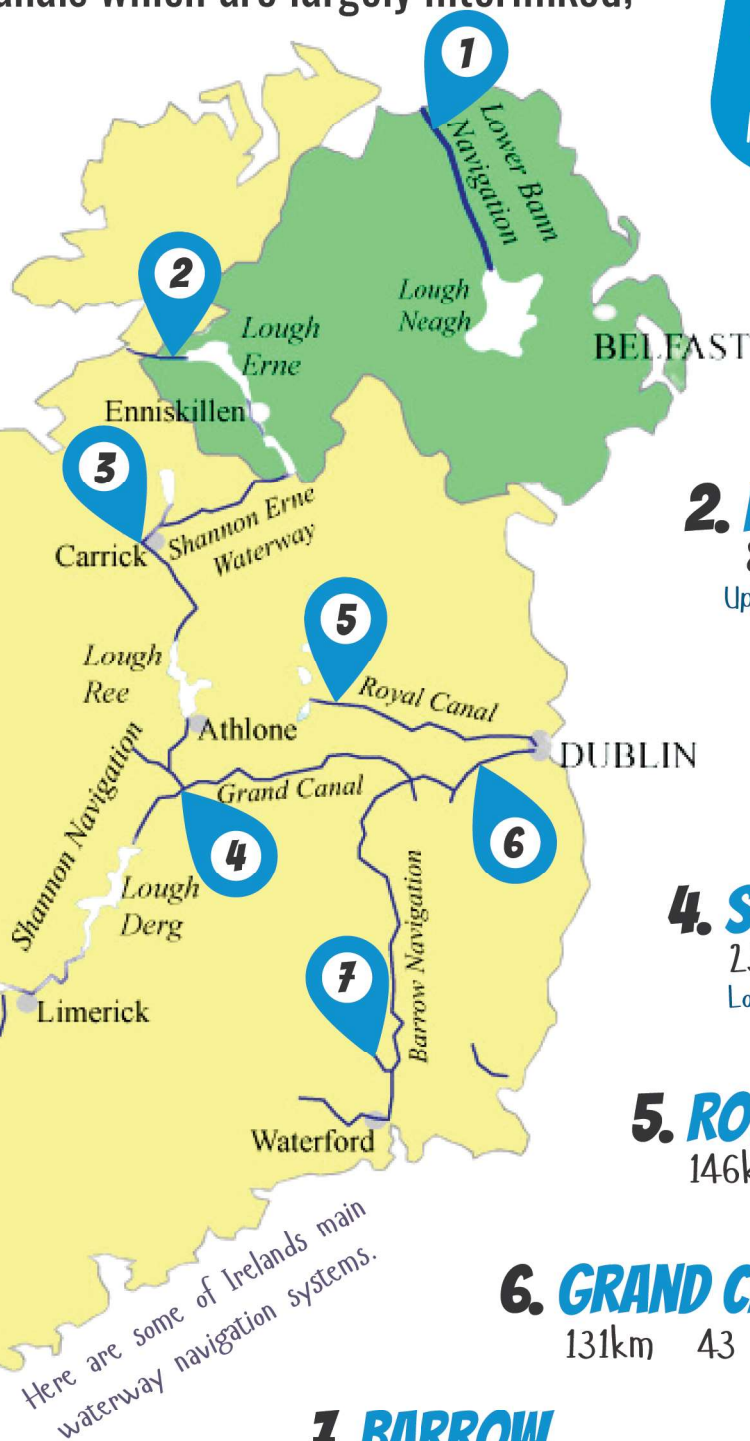
Waterways Ireland are responsible for managing our inland navigable waterways

INLAND WATERWAYS

Ireland's inland waterways consist of a vast network of rivers, lakes and canals which are largely interlinked;

There are 1,000km of navigation channels and 176 locks throughout Ireland's waterways; many are hundreds of years old!

Find out more



1. LOWER BANN
52km 5 Locks
Lough Neagh

2. ERNE SYSTEM
84km 1 Lock
Upper Lough Erne, Lower Lough Erne

3. SHANNON ERNE
63km 16 Locks

4. SHANNON
238km 11 Locks
Lough Derg, Lough Ree, Lough Allen

5. ROYAL CANAL
146km 46 Locks

6. GRAND CANAL
131km 43 Locks

7. BARROW
111km 33 Locks

Here are some of Ireland's main waterway navigation systems.



ADVENTURES AFLOAT



Scout
Helmsman



INLAND NAVIGATION CANALS & GATES

Canals are a little different from rivers; they're man-made waterways designed for transportation, irrigation, or drainage. Understanding canals is useful because they often connect rivers and lakes making up part of the navigation system.



TOWPATHS

A Towpath is a trail on the bank of a river or canal that allowed horses or a team of men pull a boat or barge along.

Common until the late 1700's during the Industrial Revolution when engines were fitted to barges.

Today, Towpaths still exist and provide a great amenity for walking and cycling. Many 'Greenway' projects exist to develop better access and enhancement.

LOCK GATES

A lock is a device used for raising and lowering boats between stretches of water of different levels on rivers and canals. Locks are used to make a river easily navigable,



Manually
Operated



'Smart'
Operated



Scouts must find out if there are local bye-laws and what are charges for permits or for lock use.





RIVER CURRENTS

Currents can have a significant impact on our river-based activities. Kayakers and Canoeists in particular should understand the factors that impact river currents and what they mean for safe and enjoyable activity on rivers.

With their endless twists, swirls, calms and ripples, rivers are constantly changing with time, by rainfall and by local geology. Where winds and tides drive ocean currents, river currents are influenced by factors such as gravity and the river's geography...

STAGES OF A RIVER

Headwater streams swiftly flow down steep mountain slopes and cut deep, v-shaped valleys. Waterfalls and rapids occur in this zone.

Lower-elevation streams merge to flow down gentle slopes. Valleys broaden as coalescing rivers start to meander.

At the lowest elevations, a river meanders across a broad, nearly flat valley and floodplain. At a river's mouth, it may divide into separate channels as it flows across a delta extending out to sea. The coastal plain and delta are made of river sediments.

fast flowing currents
with waterfalls & rapids.

YOUTH

medium flow
often with weirs.

MATURE

slow & flat

OLD

River Grading is used to assess the paddling and navigation difficulty of a river. This is based on speed and volume of currents alongside likelihood of whitewater and technical skills required to passage safely.



ADVENTURES AFLOAT

#ScoutingIrelandOnTheWater



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Overhanging and fallen trees
pose a considerable risk.



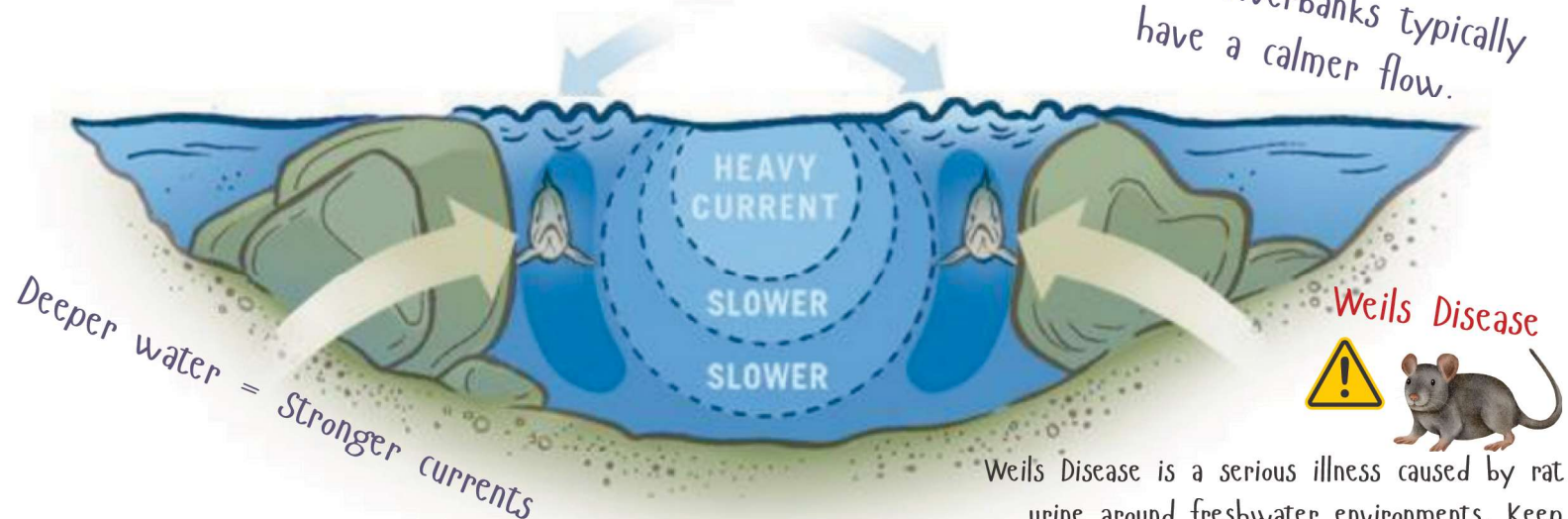
GRAVITY & GRADIENT

Gravity affects streams and rivers as the water moves downhill.

The strength of the current depends upon the volume of water, the gradient and the shape of the river.

Remember water is non-compressible, so the deeper the water and a steeper gradient means greater force and faster flow.

Shallow riverbanks typically
have a calmer flow.



Weils Disease is a serious illness caused by rat urine around freshwater environments. Keep cuts covered, wash your hands and avoid swallowing water.

Dangers Throughout a River's Journey

The dynamics and currents of the river change with the gradient and the volume of water.

After heavy rain, rivers can have increased volume making currents stronger and dangers hidden. Stay away from floodwater.

Weirs can be a dangerous feature with benign-looking currents forming a "stopper" that may trap and hold a paddler.

Similarly, natural obstructions such as a fallen tree, root system, fencing or guard rails may trap both boats and people.



Tidal Estuaries – Where A River Flows Two Ways

As a river reaches its final stage and approaches the sea, currents present other dangers for paddlers as tidal influences can be felt on the river.

As the river approaches the sea, the river currents may reverse a slow flooding tide!

Along many Irish rivers tides can run very strongly on the lower reaches, so it is essential to take advantage of tidal information found in tide tables for the relevant area you are paddling in.



BOAT MAINTENANCE FIBREGLASS REPAIRS



Plastic, wood and GRP are increasingly the demographic of boats used in Scouting today. Each material having their own unique characteristics.

GRP stands for Glass Reinforced Plastic, otherwise known as Fibreglass.

Pros of Fibreglass

- **Height Strength - Weight Ratio**
GRP is a lightweight but extremely strong material, making it a great option for boat building.
- **Low Maintenance**
Virtually no maintenance, no rotting and resistant to rust and corrosion.
- **Versatile**
Can be moulded into any shape and exact measurements!

Cons of Fibreglass

- **Brittle**
While GRP is very strong, if you bash it, it will crack.
- **Repair Process**
Some knowledge and skill is required for repair.
- **Environment**
Can breakdown over time from UV or become soft from Osmosis.

TOOLS FOR THE JOB



Resin & Hardner



This is the 'glue' that sticks it all together! Mixing these two will create a reaction and eventually harden rock solid.

Filler Powder

Adding a filler to the resin will help change its consistency so it isn't so wet.



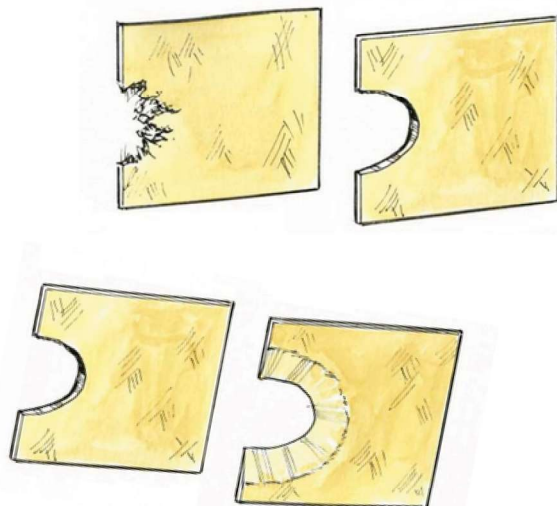
'Peanut Butter' is consistency gauge!



Methodology; we can't just lump on a layer of fibreglass. Multiple layers are required for a strong repair. We build this up after sanding around and tapering the damage like a crater. This helps create a solid and smooth repair.

INSTRUCTIONS

1. Cut-out, grind or sand around the damage to remove all loose and jagged edges.
2. Sand and grind out a tapered crater around the hole.
3. Thoroughly wipe down and clean the repair area. Acetone is ideal.
4. With your fibreglass matting, draw the size of the hole, then a bigger circle and a bigger circle. Building these layers will fill up the repair crater you made to create a good repair.
5. Mix your resin and hardener as per manufacturers recommendations, apply a liberal layer around your repair crater. Start adding your layers of fibreglass matting to fill up your repair crater.
 - Ensure the fibreglass is full impregnated by the resin. When adding layers of fibreglass be sure to gently press and brush to remove any air bubbles and excess resin.
6. Once the repair has cured, you can sand and finish to complete the job.



Repairs should only be conducted in well ventilated areas.

Fumes are dangerous.

Only mix small batches of resin at a time.



CAUTIONS

BOAT MAINTENANCE PFD TESTING



PFDs are one of those things that often get neglected on the maintenance front. Just because you're wearing it, doesn't mean it's good to go! Don't make it a checkbox item on your Safety Afloat framework. PFDs work or they don't; and you need to figure out which side you are on!



Visual Inspection

1. Check for Holes & Tears.
2. Check the fabric, is it faded and sun-bleached?
3. Do all Zips & Clips work.



If your PFD failed the Visual Inspection, you need to dump it.

Looking After your PFD

1. Rinse with Freshwater.
2. Hang to Dry.
3. Do not use as a Floormat!

If it's a personal PFD, you should really do this.
If it's a Group PFD you need to do this.

Weight Testing PFD

PFD performance is measured in Newtons (how much weight it can hold).

Over time, a PFD will lose buoyancy so it is important to spot check your inventory to discover any faults.

You will need a weight and scales to calculate this!



Weight
Testing PFD



BOAT MAINTENANCE HOW AN ENGINE WORKS



Outboard engines are simple machines and essential tools for supporting safety and access to adventures on the water.

Because of their high value to the programme, it is our job to ensure we look after them and keep them in good order.

An understanding of how they work will help us look after them.



TOP TIPS

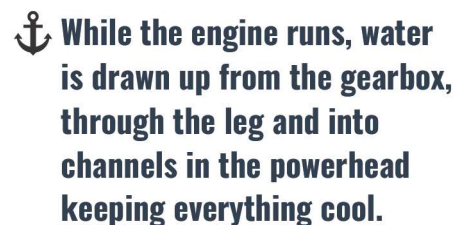
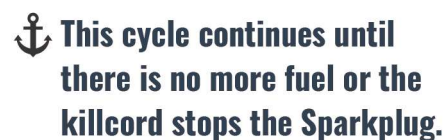
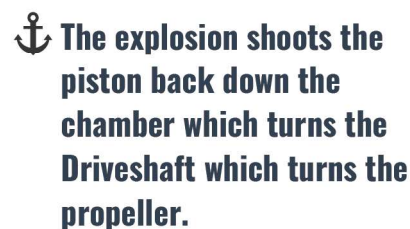
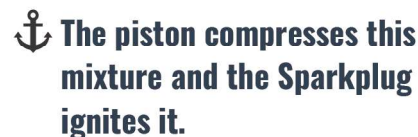
1. Look after your Fuel!
2. Run Freshwater through the Engine Cooling System.
3. Regularly spray WD40 inside the Powerhead.



PETROL



Safety
Leash





BOAT MAINTENANCE WOODEN BOAT CARE

A Scout is Thrifty

It should be considered a part of normal activities for all Scouts to take an active part in boat maintenance. Each Scout is expected to clock-up a certain number of boatwork hours before they are allowed go afloat!

1. Cleaning

2. Storage

3. Sanding

4. Painting

5. Varnishing



It's highly likely you will find some degree of woodworking on your boats.

If the boat itself is not made from wood, you may also find wooden thwarts, gunwales, tillers, rub-rails, toe-rails or rigging!

A huge array of features because wood is such an easy and workable material. but at the cost of regular maintenance needed!

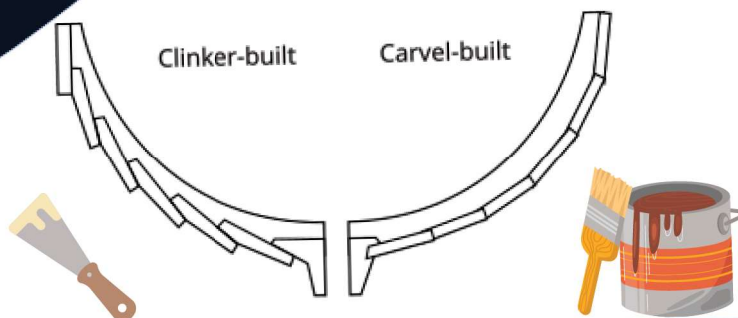
LAYING-UP

At the end of the boating season, most boats will be taken ashore for the Winter. If laying-up a wooden boat, here are some Top Tips;

- Store under cover, or at least upside-down.
- If a tarpaulin cover is used, it is a good idea to raise it up with some sort of "ridge pole" and leave openings for air to circulate.
- Inspect the boat before leaving her sit for a few weeks. Wooden boat planks are 'alive' and swell with moisture and shrink when dry. Take note of yours.



WOODEN BOAT CARE



1. Cleaning Once ashore, immediately wash with freshwater to remove, dirt, debris, mud and scrape the hull clean of weed.

2. Storage Flip the boat upside down to drain out all water and to ensure no rainwater can pool and encourage rot.

3. Sanding Sanding removes old paint and varnish, encouraging planks to dry further and is the necessary prep for the next coat of paint. 60 grit sandpaper is a good start to remove old layers.



Sanding blocks help even out your sanding efforts; be conscious not to sand over the heads of copper rivets! Copper is soft, they will perish.

lightly sand between coats for best results

4. Painting Preparation is key; ensure the boat is clean, dry and dust free.

Paint helps protect the wood from moisture and can look great!

Primer - is a base for the paint to stick to and helps seal the wood against moisture.

Top Coat - colourful and glossy protecting the wood and offering aesthetic.

Antifoul - is paint below the waterline that restricts marine growth and barnacles.

5. Varnishing Keeps the wood-look and protects from moisture and UV.

4-8 coats are needed for best results, and it will look amazing!

Coats of varnish should be wetted out first with thinner. This allows the varnish to better penetrate the wood. Start with around 20% thinner.



BOAT MAINTENANCE MAINTENANCE LOG

Ensuring our gear is fit for use is an essential part of seamanship and good practice afloat.

Something as small as a single shackle not working correctly can have a huge impact in our activities so it is important we are aware and we develop good decision-making and a system to keep gear in working order.

Poorly Maintained Gear Can;

- ✗ **Cause Injury** Damaged equipment has a high likelihood of hurting someone. A worn-out PFD or faulty engine could be fatal.
- ✗ **Reduce Opportunities** If gear is broken or unavailable, fewer people can get on the water, limiting the overall experience.
- ✗ **Increase Stress** When equipment isn't ready or functional, it creates frustration and can delay the activity, which diminishes the fun and learning.

KEY ELEMENTS OF A MAINTENANCE SYSTEM

1. Equipment Inventory List

2. Periodic Inspections

- Before Each Activity
 - Monthly
 - Annually
- there is a place for each of these!...*

3. A Damage Reporting Process

4. Repairs *who will oversee this*

5. Storage *a lock-out system*

- tools & sharps
- chemicals & oils
- fuel





SAMPLE PERIODIC INSPECTION



Scout
Helmsman

Periodic Equipment Checks is one method to ensure your gear remains in safe, working order. **Developing a Checklist** to capture this is a very useful aid.

- A) What should be inspected each time before going afloat?
- B) What should be inspected regularly throughout the year?
- C) What should be inspected annually?

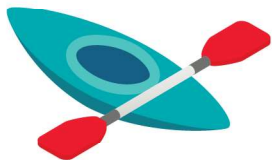
Identify Key Equipment

- List everything that is used regularly: boats, paddles, life jackets, ropes, safety kits, engines, etc.



Divide by Frequency

- Group items into "Pre-Afloat," "Periodic," and "Annual" based on how often they need checking.



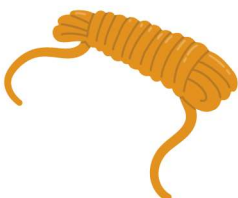
Include Actionable Steps

- For each item, specify exactly what to look for (e.g., "Check for tears" or "Ensure screws are tight").



Add a Notes Section

- Allow space to write down observations or actions needed, such as "Replace next week" or "Clean after use."



Include Name & Date of who conducted Inspection.

