



National Défense  
Defence nationale

**A-CR-CCP-612/PF-003**



ROYAL CANADIAN SEA CADETS  
CANSAIL LEVEL 2  
TECHNICAL PACKAGE

(ENGLISH)

**Issued on Authority of the Chief of the Defence Staff**

Canada<sup>🇨🇦</sup>



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**Contact Officer: Staff Officer Sea Cadet Program Development**

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## FOREWORD AND PREFACE

1. **Issuing Authority.** This Technical Package A-CR-CCP-612/PF-003 was developed under the authority of the Director Cadets and Junior Canadian Rangers (D Cdts & JCR), and issued on the authority of the Chief of Defence Staff.
2. **Development.** Development of this Technical Package was in accordance with the performance oriented concept of training outlined in the Canadian Forces Individual Training and Education System A-P9-050 Series, *Manual of Individual Training and Education*, with modifications to meet the needs of the Canadian Cadet Organizations (CCO).
3. **Purpose of the Technical Package.** Following the first season of the implementation of Sail Canada's *CANSail Dinghy Program* and new instructor tools, feedback coming from the field identified the need for technical packages to augment the existing Instructor Packages developed by Sail Canada in support of the program. Incorporating a variety references and resources, this Technical Pack is intended to give detailed descriptions, information and video links for the various skills covered in the *CANSail Program*.

It should be noted that not all of the information included in this package needs to be passed along to the sailors. This package is intended to give the instructor the necessary background information to fully understand the skills being taught and some fundamental coaching tips. When using this package, the instructor should refer back to the applicable *CANSail* Rubric to ensure they assess the skills IAW the standard.

Note. This technical package focuses on *CANSail* skills in a doublehanded sailboat.

4. **Use of the Technical Package.** Throughout this technical package, a series of information boxes are used to highlight information; they include:



Note to the Instructor.



Key information to pass along to sailors.



Refer to the following CF regulations and policies.



Points of interest or special instructions the instructor should pass along to sailors.

**5. Suggested Changes.** Suggested changes to this document should be forwarded by e-mail to [sea.dev@cadets.gc.ca](mailto:sea.dev@cadets.gc.ca) or to National Defence Headquarters (NDHQ) Attention: Staff Officer Sea Cadet Program Development.

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## ROYAL CANADIAN SEA CADETS

### CANSAIL LEVEL 2

### TECHNICAL PACKAGE



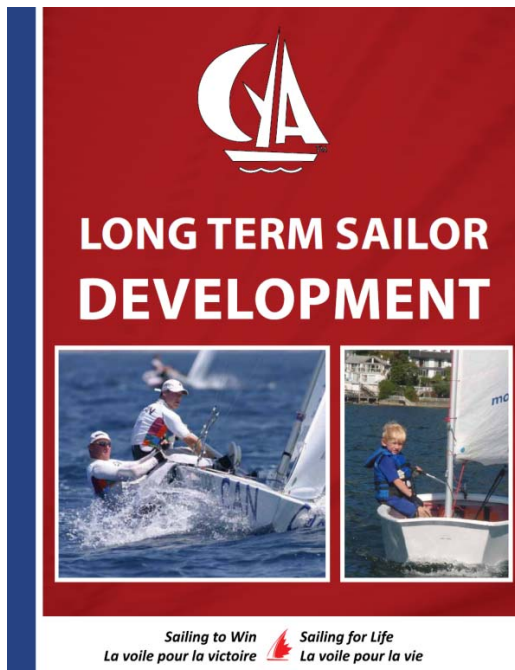
## PHYSICAL LITERACY

### LONG TERM SAILOR DEVELOPMENT

Sail Canada (SC) has designed all CANSail curricula around the Long Term Sailor Development (LTSD) framework. In addition, all SC events adhere to recommendations and guidelines for training and competition as set out in the LTSD.

What does this mean for you as an instructor? It means that the lessons that you provide for sailors are designed for their developmental age. Developmental age refers to a sailor's stage of development, as opposed to how old he or she might be.

It's important that all CANSail instructors understand the LTSD, and how it relates to CANSail programming. In order to do this, you must take the online LTSD module. You can do this during your CANSail Fundamental Course, or on your own time. Below is a link to access the online LTSD module on the Sail Canada website.



Scan for LTSD Online Module  
Or go to <http://www.sailing.ca>

The LTSD framework provides recommendations for on-water training, dry-land, training, physical training, equipment, and competition.



## NUTRITION

What goes into a body has a significant impact on energy and performance levels later. Sailing is essentially an endurance sport however it also involves frequent anaerobic movements, which presents unique dietary and hydration requirements. To further complicate things, sailing takes place far from land so it is necessary for sailors to plan ahead.

### BREAKFAST

Breakfast is the most important meal of the day because it jump-starts the body's metabolism. Sailors should avoid greasy food, and instead consume whole simple foods, which are high in carbohydrates and moderate in protein. For example: whole grain cereal, boiled egg or yoghurt, a banana and orange juice. This meal provides the body with essential nutrients, and the simple foods will be easily digested giving the body energy shortly after consumption.

### MIDMORNING SNACK

In the middle of the morning, metabolic and energy rates begin to decrease. To counteract this and keep energy levels high, sailors should have a snack containing both complex carbohydrates (whole grains) and a small amount of protein. Snacks may include cereal / granola bars or low-acid fruits. Due to the nature of sailing, the snack break will likely be brief and offer limited time for digestion so snacks should be large enough to provide energy but small enough that the sailor can continue practicing without feeling full.



Bananas are often given as a mid-practice snack because of their high levels of potassium and ease of transportation; however this practice can actually hinder performance. Bananas are dense and slowly digested which makes them ideal as part of a pre-practice meal however should be avoided within one hour of activity.

### LUNCH

Sailing is unique because it is one of the few sports where athletes train all day, and require a lunch break in the middle of training. With this in mind, a mid-practice lunch requires the same characteristics as a pre-practice breakfast. The meal should consist of lean protein, complex carbohydrates (whole grains), low-acid fruits and vegetables. Once off the water, the meal should be consumed as quickly as possible to allow ample time for digestion and energy replacement prior to the afternoon practice.

### MIDAFTERNOON SNACK

Just as in the morning, metabolic and energy rates begin to decrease in the middle of the afternoon. This decrease tends to be more apparent because wind speeds are often higher in the afternoon. Snacks may include cereal / granola bars or low-acid fruits.

### SUPPER

After a long day of the water supper needs to replace electrolytes and nutrients lost due to sweat and promote muscle recovery. The meal should be high in lean protein (fish or lean pork), moderate in complex carbohydrates (brown rice or whole grain pasta) and high iron vegetables (spinach, bell peppers and broccoli). To promote muscle recovery, this meal should be consumed as quickly after practice as possible.

## COACHES CORNER—NUTRITION

Sailors often consume meals prepared at home, or at a cafeteria, which gives coaches very little power over the types of food their athletes consume. Instructors can lead by example and make a conscious effort to consume healthy meals whenever at the sailing school.

Instructors can also influence the decisions their sailors make by using a self-reporting technique. Through informal conversation, instructors can ask sailors to report their energy levels and muscle fatigue / recovery. By discussing the impacts that fatty or complex foods can have on performance, and highlighting when proper eating habits have a positive impact on self-reported energy levels, instructors can instill the benefits of making sound food-related decisions.

## HYDRATION

The importance of daily water intake is frequently emphasized in sports and nutrition and healthy living articles. Outside of exercise, the following table can be used as a reference for daily water intake.

Body Mass		Litres
50 kg (110 lbs.)	x 0.036 L	1.8
60 kg (132 lbs.)	x 0.036 L	2.2
70 kg (154 lbs.)	x 0.036 L	2.5
80 kg (176 lbs.)	x 0.036 L	2.9

Due to the length of time spent on the water and subsequent exposure to environmental conditions, dehydration is common in sailing. Even mild dehydration can impair skill and judgment on the water so strategies to minimize dehydration should be introduced to sailors during their introduction to the sport. Appropriate education can help sailors identify their individual needs in specific weather conditions and racing / training scenarios. Sailors should be encouraged to keep a water bottle in their sailboat or in the coach boat. Sports drinks are the ideal choice as they also provide fuel to help maintain blood glucose levels during racing. Extreme heat and environmental conditions may also warrant the use of sports drinks with higher levels of electrolytes.

The following is a recommended hydration routine for a full day practice:

- 500mL (one cup) of water immediately after getting out of bed.
- 500mL of water consumed over the span of one hour, starting with breakfast and continuing until the beginning of practice.
- 250mL of water during each practice break (not to exceed 1250mL per hour).
- 500mL of water or sports drink consumed over the span of a one hour lunch break.



Sports drinks contain fructose, fructose syrup high fructose corn syrup or crystalline fructose, or sugar as the first ingredient on the ingredients list.

If “clean” sports drink is not available, water can be made to taste better by adding a pinch of salt, ensuring it is chilled or by adding real lime, lemon, orange, ginger root,

peppermint leaves or other herbs.

Note. Water should be the main fluid source for the entire day; clean sports drinks should be consumed in moderation.

- 250mL of water or sports drink during each practice break (not to exceed 1250mL per hour).
- 500mL of water or sports drink consumed over the span of a one hour supper break.
- 250mL of water consumed in the last hour before bed.



The most important information in the recommendations above is the routine, not the quantities. Sailors should adjust amounts based on physical size, the amount they sweat and the practice intensity.

Thirst is an early warning sign of dehydration. Sailors should consume enough water / sports drink to avoid thirst, and not enough to give abdominal discomfort / bloating.



Sports drinks are designed to replace salt and electrolyte loss as the result of sweating. Based on wind speed and practice intensity sports drinks are not typically required in the morning practices, however gain importance as the practice day progresses.

## COACHES CORNER—HYDRATION

Instructors, especially when coaching basic levels can easily overlook the hydration requirements of sailors. Drinking fluids while on the water is something that should be instilled at the beginning of a sailor's career to ensure it becomes habitual. Failure to do so will result in diminished performance on the water and increase the likelihood of missing time on the water, or leaving the sport entirely. When transitioning between drills, be sure to allow for a short rest and hydration break.

## WARM-UP ACTIVITIES

### WARM-UP

Sailing in Canada often occurs in cool climate and even cooler water temperatures, making it very important to warm-up the body before exercising. Sailing involves a number of awkward movements, so it is important to stretch before heading out on the water. When muscles and ligaments are cool, they can be slow moving and tight, making it important to adequately warm-up muscles before stretching.

Warm-up activities for sailing should focus on getting the entire body moving and engage the cardiovascular system for 5–7 minutes. To prevent injury caused by stretching cold muscles, a warm-up should start with a full body warm-up, followed by a bottom-to-top stretching activity with emphasis on hips, trunk and upper body. To help prevent injury and promote optimum performance muscle groups stretches should be 20 seconds in duration and stretched at least twice.



Depending on the length of lunch break, it likely will not be necessary to complete a warm-up activity prior to going on the water in the afternoon. A brief stretching routine however should be conducted immediately after the morning session, and before the afternoon session.

## COOL DOWN

Sailors typically come off the water wet, which drastically increases the speed that muscles cool down after practice and competition. For this reason, it is important to conduct a cool down stretching session as soon as possible once off the water. Stretching will increase blood flow in tired muscles; reducing cramping and promoting muscle recovery.

### COACHES CORNER—WARM-UP AND COOL DOWN ACTIVITIES

Warm-up and cool down activities can be used to promote teamwork and provide leadership opportunities within the group. Build these activities into part of the daily practice routine, and assign a “Team Leader” to facilitate the daily morning activity and cool down sessions.



Need warm up activities ideas? Try this:

[http://www.aisnsw.edu.au/Services/PL/PDHPESecondary/Documents/minor\\_games\\_booklet.pdf](http://www.aisnsw.edu.au/Services/PL/PDHPESecondary/Documents/minor_games_booklet.pdf)

*Note. Retrieved February 2013.*

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## PREPARE FOR SAILING

### HYPOTHERMIA

#### HYPOTHERMIA

The condition of having an abnormally low body temperature (35°C or lower). This is caused by exposure to cold air temperature or cold water, both of which can occur when sailing.

#### Stages of Hypothermia

There are three stages of hypothermia:

- mild,
- moderate, and
- severe.

#### Signs of Hypothermia

Signs	Mild Hypothermia	Moderate Hypothermia	Severe Hypothermia
<b>Pulse</b>	<ul style="list-style-type: none"> <li>• normal.</li> </ul>	<ul style="list-style-type: none"> <li>• weak.</li> </ul>	<ul style="list-style-type: none"> <li>• weak, irregular or absent.</li> </ul>
<b>Breathing</b>	<ul style="list-style-type: none"> <li>• normal.</li> </ul>	<ul style="list-style-type: none"> <li>• slow and shallow breathing.</li> </ul>	<ul style="list-style-type: none"> <li>• slow or absent.</li> </ul>
<b>Appearance</b>	<ul style="list-style-type: none"> <li>• shivering, and</li> <li>• slurring speech.</li> </ul>	<ul style="list-style-type: none"> <li>• shivering violently,</li> <li>• clumsy,</li> <li>• stumbling,</li> <li>• pupils becoming dilated, and</li> <li>• skin becoming bluish.</li> </ul>	<ul style="list-style-type: none"> <li>• shivering has stopped.</li> </ul>
<b>Mental State</b>	<ul style="list-style-type: none"> <li>• conscious but withdrawn or disinterested.</li> </ul>	<ul style="list-style-type: none"> <li>• confused,</li> <li>• sleepy, and</li> <li>• irrational.</li> </ul>	<ul style="list-style-type: none"> <li>• unconscious.</li> </ul>

#### Hypothermia Prevention

The following are measures to be taken to prevent hypothermia:

- **Dressing warmly.** Dressing for the weather plays a key role in preventing hypothermia. The air temperature on the water is often much colder than on land, therefore wearing extra clothing is recommended.
- **Staying dry.** Capsizing and swimming are fun components of sailing. When the air and water temperatures are cold it is recommended to stay out of the water and stay dry.



Immersion hypothermia is caused by being in cold water. A person will lose body heat 25 times faster in water, than in air of the same temperature.

- **Wearing a waterproof layer.** Sailing is a wet sport. It is possible to become wet without falling overboard or capsizing. A waterproof jacket or rain gear may be worn to keep clothes from becoming wet.
- **Adopting the heat escape lessening position (H.E.L.P.).** Adopting the H.E.L.P. position when in the water alone will decrease the amount of body heat lost by half. The H.E.L.P. position is adopted by a person holding their knees up to their chest.

## TREATMENT OF MILD HYPOTHERMIA

If it is suspected that someone is suffering from mild hypothermia due to immersion, the following treatments are recommended:

1. remove the individual from the water;
2. cover exposed skin with clothing or blankets and insulate the head;
3. adjust clothing to keep the wind away from the skin;
4. remove the individual from the wind;
5. remove wet clothing; and
6. begin controlled re-warming, by having the individual:
  - a. keep muscles active and relaxed;
  - b. take a warm bath (not too hot);
  - c. drink a warm (not hot), non-alcoholic or non-caffeinated drink;
  - d. warm up by layering blankets; and
  - e. cuddle with another person, using body heat to slowly warm the core temperature.



Always handle the individual very gently and keep the casualty as horizontal as possible.

## COACHES CORNER—HYPOTHERMIA

### HYPOTHERMIA AND SAILING

In the context of dingy sailing, mild hypothermia is most common in junior sailors who have not yet become accustomed to dressing for the weather, forecasted conditions and water temperature. Instructors can coach their sailors to dress appropriately by posting the daily forecast and highlighting the forecasted weather during the morning and afternoon briefings. To ensure new sailors do not have a bad experience during their introduction to sailing, instructors should not allow their athletes to go on the water unless dressed appropriately.



If possible, keep a few sets of sail clothing in the instructor office. It is better to lend your personal gear, than a new sailor sitting on shore because they are improperly dressed.

## HEAT-RELATED ILLNESSES

### HEAT-RELATED ILLNESSES

The condition of having an abnormally high body temperature. This is caused by prolonged exposure to extreme heat or heavy exertions in a hot environment, both of which can occur when sailing.

#### Stages of heat exposure and illnesses

There are three stages of heat exposure and illnesses:

- **Heat cramps.** Painful muscle cramps, usually in the legs and abdomen, caused by losing too much water and salt through sweating. Heat cramps are most commonly caused by heavy exercise or physical work in a hot environment.
- **Heat exhaustion.** Triggered by the loss of fluid through sweating, and worsened by blood flowing away from major organs and pooling just below the skin. Sign and symptoms include:
  - excessive sweating,
  - dilated pupils,
  - complaints of dizziness, blurred vision, headache or cramps, and
  - signs of shock, including cold, clammy skin, weak and rapid pulse, shallow breathing, vomiting and unconsciousness.
- **Heat stroke.** Caused by prolonged exposure to a hot, humid and potentially poor ventilated environment. A life-threatening condition where the body's temperature rises far above normal. Sign and symptoms include:
  - body temperature rapidly rises to 40°C or higher,
  - pulse is rapid but full, and gets progressively weaker,
  - heavy breathing,
  - skin is flushed and hot to the touch—skin is sweaty but becomes dry as the condition deteriorates,
  - complaints of dizziness, blurred vision, headache or cramps,
  - disoriented and erratic behaviour, and
  - vomiting, convulsions and unconsciousness.

#### Heat Illness Prevention

The following are measures to be taken to prevent heat illnesses:

- **Dressing in layers.** Dressing for the weather plays a key role in preventing hypothermia, however physical exertion while sailing can quickly increase body temperature. Dressing in layers allows sailors to dress warmly if required, and easily remove layers to regulate body temperature as needed.
- **UV Protection.** Dressing to avoid the adverse affects of the sun reduces the likelihood of sunburns and subsequent overheating. Sailors should personalize their UV protection strategy using various combinations of sun block, hats, visors, UV guards and sunglasses, based on hair

thickness and skin complexion, light sensitivity and personal preference.

- **Hydration.** Hydration consideration before, during and after practice / competition helps reduce the likelihood of developing a heat-related illness. Thirst is an early indicator of dehydration, so sailors should consume sufficient fluid to avoid feeling thirsty.
- **Rest Periods.** When temperatures reach 25°C, rest periods should be given every 50 minutes and increased in frequency as required. Practice intensity should be adjusted based on temperature, age and the average heat sensitivity / acclimatization of the group.



Swimming is a perfect way for sailors to quickly cool off on a hot day.

## TREATMENT OF HEAT STROKE

If it is suspected that someone is suffering from heat stroke, the following treatments are recommended:

1. call for medical help as soon as possible;
2. remove the individual from the warm environment and place them in a cool, shady location;
3. remove the outer layer of clothing and immerse the individual in cool water up to the chin (monitor closely);
4. if cool bath is unavailable, cover the individual in cool wet sheets;
5. when body is cool to the touch, remove from the cool bath and cover in a dry sheet; and
6. place in the shock / recovery position and give ongoing care until medical help arrives.

## COACHES CORNER—HEAT-RELATED ILLNESSES

### HEAT-RELATED ILLNESSES AND SAILING

Some sail Instructors are guilty of drinking a lot of fluid in the coach boat, but neglecting to give their sailors sufficient time to hydrate in between drills. Heat cramps and more severe heat related illnesses can be avoided by building hydration and rest breaks into the daily practice routine. Depending on the sailboat class, sailor should be encouraged to keep a water / sports drink bottle in their boat / coach boat and hydrate during each practice break.

Proper planning for UV protection and hydration will reduce the likelihood of heat-related illnesses while simultaneously boosting athlete performance during practice and competition.

## LOCAL HAZARDS

### HAZARDS

**Geographic hazards.** Naturally occurring obstructions that pose a safety concern to a vessel.

Geographic hazards will be different in every body of water. The following are some common types of geographic hazards:



- shoals,
- sandbars,
- narrow channels,
- large rocks, at or near the surface,
- strong currents, to include:
  - downstream flow from a river, and
  - tidal action in coastal areas; and



Strong currents that flow against the wind can often be spotted by unusually steep and choppy waves.

Strong currents that flow with the wind can often be spotted by exceptionally smooth, slick looking water.

- shifty, gusty winds, located:
  - near steep shores,
  - behind islands,
  - in narrow channels, and
  - downwind of tall buildings or tall rock formations.

**Navigational hazards.** Man-made obstructions that pose a safety concern to a vessel.

Navigational hazards will be different in every body of water. The following are some common types of navigational hazards:

- breakwaters,
- large piers,
- bridges,
- overhead electrical cables,
- dams,
- commercial shipping lanes, and
- deadheads.



**Deadhead.** A sunken or submerged log.

## LOCAL WEATHER HAZARDS

**Weather hazard.** A meteorological event which poses a safety concern to a vessel.

Every body of water is different, generating unique weather hazards affecting the ability to sail in a safe environment. Certain weather hazards will prevent sail training from being conducted, depending on the severity and type of weather hazard. The following are some common types of local weather hazards:

- **Thunderstorms.** A storm with thunder and lightning usually consisting of rain. Thunderstorms can be identified by tall thunderclouds (cumulonimbus clouds). These clouds create a low

ceiling; they are tall in the sky usually grey on top and very dark on bottom (as illustrated in Figure 1).

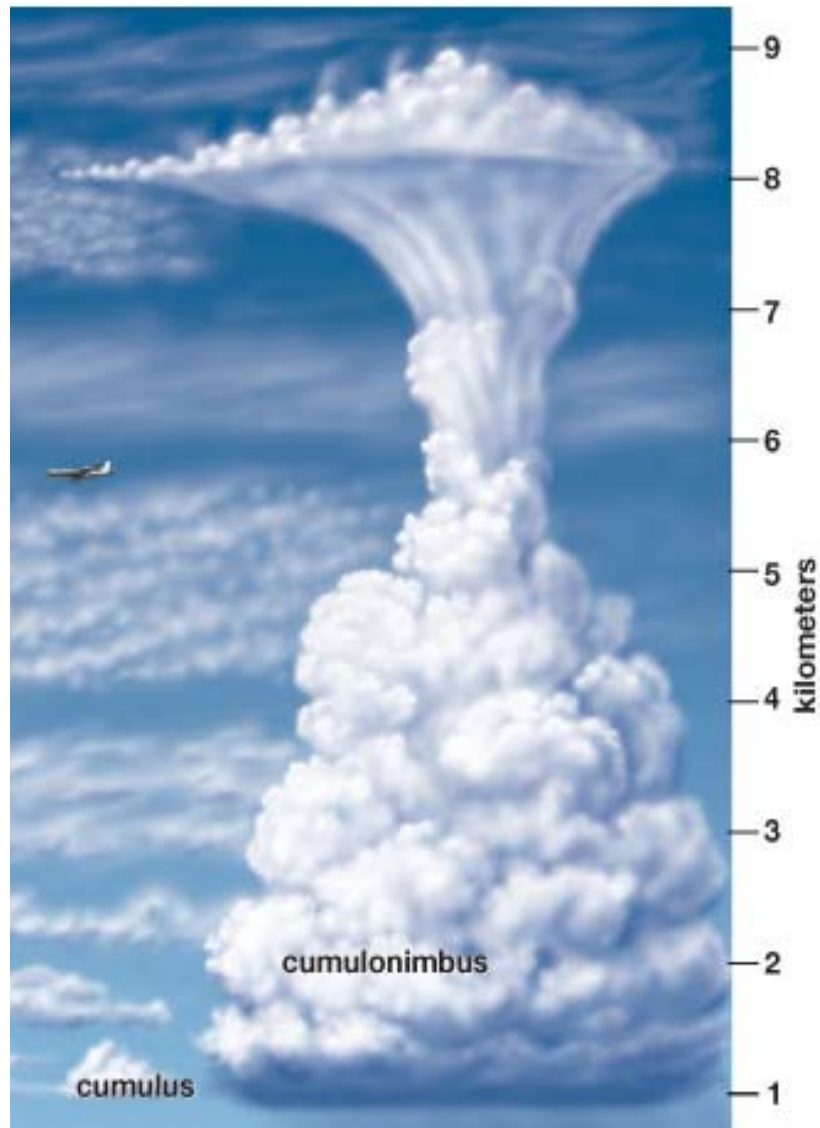


Figure 1 Cumulonimbus Clouds

Note. From *Encyclopaedia Britannica Online*, Copyright 2006, by Encyclopaedia Britannica, Inc. Retrieved November 21, 2007, from <http://cache.eb.com/eb/image?id=93302&rendTypeld=34>



Thunderclouds will often appear 30 minutes before a thunderstorm arrives. If thunderclouds are spotted return to shore immediately.

- **Line squalls.** A sudden and short-lived gust of wind. Line squalls can be identified by a fast approaching line of dark water.
- **Fog.** A thick cloud of water near the Earth's surface. Fog reduces visibility making it difficult to navigate.

- **Temperature.** A sudden increase or decrease in temperature is often a sign of changing weather. If a dramatic temperature occurs, sailors should watch the horizon for approaching changes in wind direction and speed.

## COACHES CORNER—LOCAL HAZARDS

### ROUTE PLANNING

Damage to sails, hull and foils are commonly caused by poor awareness of local hazards around the normal launching and training area. Discuss in briefings with your sailors the local hazards between the dock / slipway and normal training area and how best to avoid or reduce their effects, focusing on route planning, boat handling and manoeuvring when launching and recovering. Encourage sailors to actively plan their routes when entering / departing an area and discuss the importance of providing other boats with enough space to manoeuvre safely.

## RIGGING



Every type of sailboat is rigged slightly different. Throughout the course, it is recommended that the sailors be exposed to different sailboats, if available, and methods of rigging.



Most boat manufactures publish online rigging manuals for their sailboats. The following section outlines the level of detail that should be presented at the CANSail 1 & 2 Level. When preparing to rig a sailboat, consult the manufacturer's rigging guide to ensure the boat is set up properly.

## ROPEWORK

**Reef knot.** Used to join two lines of the same diameter and type (eg, manila, polypropylene, etc.)



Figure 2 – Reef Knot

**Figure eight.** Used as a 'stopper knot' to prevent a line from slipping through a block or fairlead.

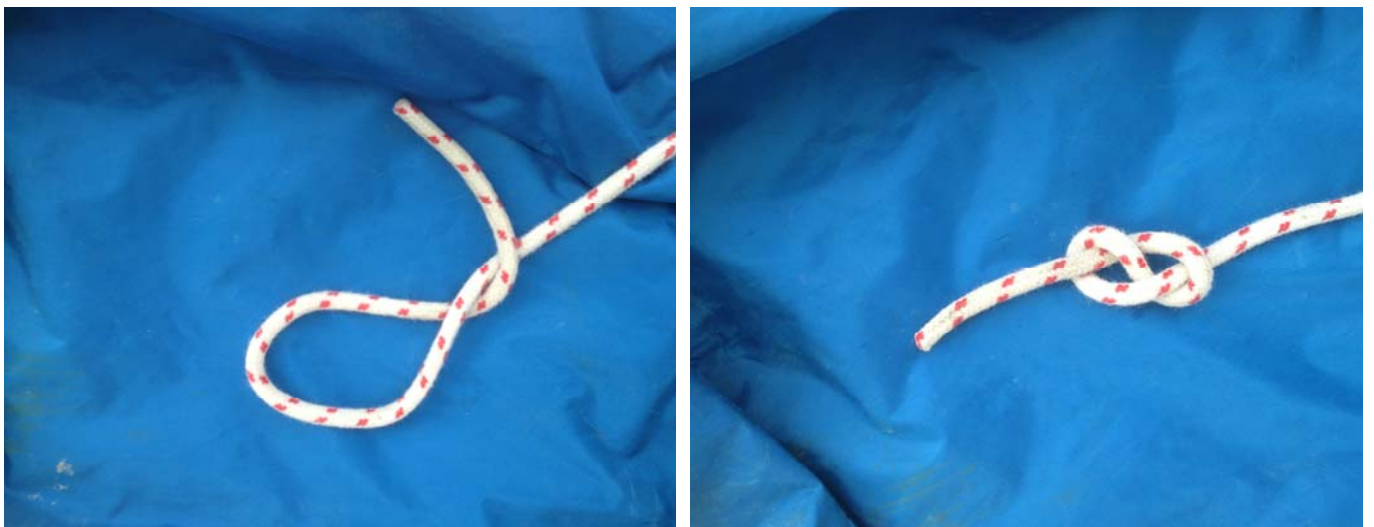


Figure 3 Figure Eight

**Bowline.** Makes a non-slip loop in the end of a line. Used to tie the painter to a bow ring, for attaching sheets and halyards to sails, and for many other purposes.



Figure 4 Bowline

**Figure eight through a bight (racing knot).** A bight passed through a grommet or cringle, which is secured in place by the standing end of the line with a figure eight knot. A low profile knot which is ideal for securing halyards.



Figure 5 Racing Knot

**Kiwi Bowline.** Used to secure a line to a grommet or cringle (used instead of a racing knot should be line be too thick or thin for the cringle). An overhand, which is secured in place with a second overhand knot. A low profile knot which is ideal for securing halyards.



Figure 6 Kiwi Bowline

## PARTS OF A SAIL

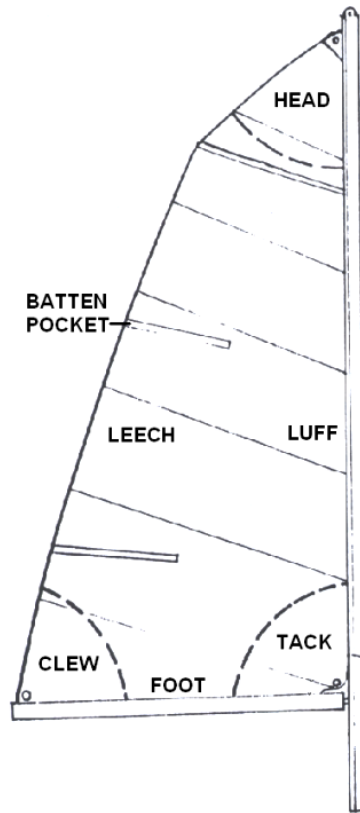


Figure 7 Parts of the Sail

*Note.* From *Basic Sailing Skills Manual* (p. 37), by S. Donaldson, 2001, Kingston, ON: Canadian Yachting Association. Copyright 2001 by Canadian Yachting Association.

**Head.** Upper corner of a sail.

**Tack.** Lower, forward corner of a sail.

**Clew.** Lower, aft corner of a sail.

**Luff.** Forward edge of a sail extending from the head to the tack.

**Leech.** Aft edge of a sail extending from the head to the clew.

**Foot.** Lower edge of a sail.

**Bolt rope.** Rope sewn along the luff and the foot of a mainsail which slips into a groove in the spars.

**Cringle.** Reinforced ring on the corners of a sail to which a line is attached.

**Batten pocket.** Slots sewn in the leech where battens are inserted to maintain the proper shape of the mainsail.

**Hanks.** Metal or plastic fitting used to secure the jib sail to the forestay.

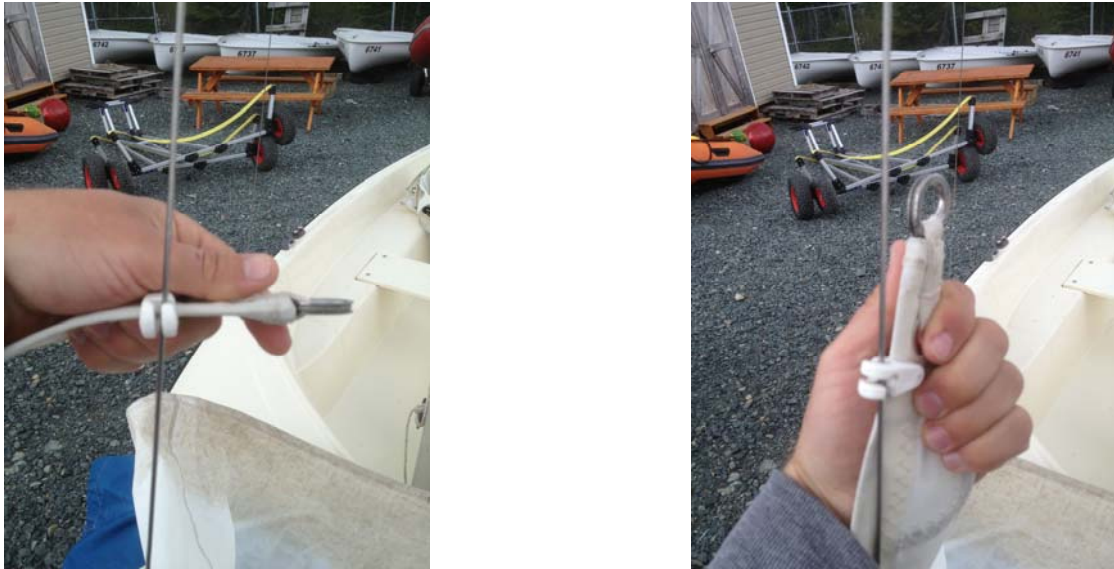


Figure 8 Jib Hank

## COACHES CORNER—RIGGING

Instructors should spend time with their sailors while they are rigging and focus on ensuring control lines are properly rigged, halyards are tight and lines are neatly coiled and stowed. Assisting the sailors as required, demonstrate how to tie the various knots, bends and hitches used to properly rig a sailboat.

Although sail controls are not taught until CANSail/ Level 3, time spent showing the sailors rigging tips and how the various lines work will ensure all of the rigging functions properly, and that the boat is correctly tuned for the conditions.



---

## TURTLE RECOVERY PROCEDURE

### TURTLE RECOVERY

#### THE STEPS TO RIGHTING A TURTLED SAILBOAT

1. **Check yourself.** Check for lines, tangles, or injuries.
2. **Check your crew.** Communicate with the crew and ensure they are okay.
3. **Release any cleated sheets.** If any sheets are cleated, release the sheet so the wind does not fill the sail once the boat is righted.
4. **The crew manoeuvres to the bow.** Using the “hand over hand” method, the crew will move to the bow of the sailboat.
5. **The helm manoeuvres to the centre of the hull.** Using the “hand over hand” method, the helm will move to the centre of the hull.



Unless turtling for training purposes, sailors should move to the centreboard as quickly as possible to avoid turtling.

6. **The crew swims the sailboat head to wind (irons).** By using the bow or painter the crew will pull the bow of the boat head to wind.
7. **The helm holds the centreboard (daggerboard) and leans back until the sailboat is in the capsized position.** The helm will stand on top of the underside of the gunwales while leaning back and pulling on the centreboard.



If the sailboat is difficult to bring to the capsized position, the helm or crew can reach under the sailboat and use a jib sheet for extra leverage in righting the sailboat. Depending on the size of the individual, this can stretch the jib sail and should only be used as required.

If the sailboat is equipped with trapeze, the trapeze adjustment tackle can be used instead of the jib sheet.

8. **Complete the capsized procedure.**
9. **Bail the water and continue sailing.**



Figure 9 Turtled Sailboat

*Note.* From *Basic Sailing Skills Manual* (p. 93), by S. Donaldson, 2001, Kingston, ON: Canadian Yachting Association. Copyright 2001 by Canadian Yachting Association.

## COACHES CORNER—TURLING

### PRE-TURTLE SAFETY BRIEFING

Capsizing is a normal part of dinghy sailing, however it can be intimidating to new sailors to the sport. A sailor's first turtle should be completed in a controlled setting under direct supervision from a sail instructor.

When alongside a sailor's boat about to capsize for the first time, complete the following briefing:

- **Ensure proper seamanship.** Ensure the rudder and dagger board are secure (centreboard pennant is cleated) to prevent losing them. Ensure all halyards are coiled and that there are no tangling in any of the running rigging. This is done to ensure the sailors do not get tangled in any of the lines when the sailboat capsizes.
- **Remain with the sailboat.** Never leave the sailboat for any reason (eg, retrieve a bailer, paddle, etc), unless instructed to do so by a sail instructor.
- **Don't panic.** Safety boats and qualified staff are present and will assist when a sailboat capsizes. One of the biggest concerns cadets have when they capsize is keeping their heads above water. PFDs are designed to keep individuals afloat, so sailors should relax and take a deep breath.
- **Clear yourself from the hull.** As soon as the boat capsizes, swim out from the aft section of the cockpit area. This ensures sailors are clear of any lines and prevents them from being entrapped under the boat when it turtles.



Most basic sailboats have a deep cockpit, which becomes an air pocket when the boat turtles. If as a result of a capsize a sailor finds themselves in the air pocket, they should signal to their crew that they are “OK”, and exit under one of the aft gunwales as soon as possible.

On a light wind day (and depending on the type of boat), have your sailors complete controlled turtles and experience being inside the air pocket.

- **Using the “hand over hand” method when manoeuvring around the sailboat.** Never attempt to swim around the sailboat. Maintain contact with a part of the hull at all times. This will ensure that the sailboat and sailors do not drift apart.
- **Communication.** Maintain verbal communication among all crewmembers.

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## BALANCE

### BODY POSITION

A sailor's ability to steer, trim sails, maintain boat balance and switch sides is greatly influenced by where and how they are sitting in the boat.

#### UPWIND

The helm focuses on steering upwind. The body is typically positioned as far forward as possible in the cockpit their forward leg resting against the traveller bar or thwart. Feet are together under the hiking straps with knees facing straight out from the torso. The back is straight, and shoulders are outside of hips to promote good posture, breathing, circulation and prevent lower back pain. The tiller extension is in the aft hand cross the lap or on the gunwale next to the hips. Eyes are looking forward at the jib luff and up at the mainsail leech tell tale.

The crew is focused on watching the water and looking out for other boats, while maintaining boat balance. Regardless of position in the sailboat, shoulders are outside of hips with eyes looking forward, focusing on wind and water to windward, and other sailboats coming from leeward. The body is in constant motion adjusting windward / leeward to maintain balance based on changes in wind speed, and forward / aft to keep the stern out of the water and prevent the bow from digging into waves.

#### DOWNWIND

The helm focuses on maintaining boat speed and steering towards the mark. The body is positioned slightly aft (with shoulders outside of hips) from the traveller bar or thwart to prevent the bow from digging into waves. If reaching, the helm is sitting on the windward side looking over their forward shoulder focusing on wind and water, as well as at the mainsail leech tell tale. If running, the helm switches to the leeward side, allowing the crew to trim the jib sail from the windward gunwale. Eyes are focused on wind and water coming from behind the boat, with the crew communicating information about other boats and mark location in front of the boat.

When reaching the crew maintains boat balance, but the helm is responsible for boat balance while running; allowing the crew to focus on trimming the jib sail. Regardless of position in the sailboat, shoulders are outside of hips with eyes looking forward, focusing on wind and water in front of the boat, and other sailboats coming from leeward. When reaching, the body is in constant motion adjusting windward / leeward to maintain balance based on changes in wind speed, and forward / aft to keep the stern out of the water and prevent the bow from digging into waves. When running, the crew moves to the windward gunwale to focus on trimming the jib sail. The crew fine-trims boat balance by moving at the torso, however the helm is primarily responsible balance and trim.

### READING THE WATER

#### READING THE WATER

Sailors tune their sailboats for the average wind and wave conditions of the day and adjust the sail trim and their crew weight as the sailboat enters and exits gusts and lulls.

- **Gust (synonym—puff).** An abrupt increase in wind speed, which appears on the water's surface as dark, rippled patches.
- **Lull (synonym—hole).** An abrupt decrease in wind speed, which appears on the water's surface as a smooth or glassy area.

By keep their eyes out of the boat and reading the water, sailors can anticipate upcoming gusts and lulls. When sailing upwind the sailboat will sail into gusts, lulls and large waves; the crew focuses their attention forward and communicates upcoming changes in wind speed and wave height to the helm. When sailing downwind, gusts, lulls and waves will catch up to a sailboat from behind; the helm focuses their attention behind the boat and communicates upcoming changes in wind speed and wave height to the crew.



Sailing partners develop their own slang to identify upcoming gusts, lulls and waves (eg, puff, pressure, breeze, hole, soft sport, bump etc). To avoid confusion, sailing partners should be consistent with their communications and use the same term every time.

## MAINTAINING BALANCE

### GUSTS

The abrupt increase in wind speed created by a gust will cause the sailboat to accelerate and heel; however to get the most boat speed out of a gust the sailboat must be kept flat and sailing straight. By watching the water, sailors can anticipate gusts and begin hiking and easing the mainsheet slightly as the gust hits, therefore keeping the boat flat.



If the gusts are too strong to keep the sailboat flat, the helm can head up slightly to reduce the pressure in the sails. This will cause the sailboat to slow down, but is an effective method for avoiding capsize.

### LULLS

The abrupt decrease in wind speed created by a lull will cause the sailboat to slow down, and heeling force is reduced. By watching the water, sailors can anticipate lulls and prepare to move inboard and trim the mainsheet slightly as the sailboat enters the lull.



A flat boat is a fast boat.

When a sailboat exits a gust, the resulting change in forces will be similar to sailing into a lull and vice versa when exiting a lull. Sailors maintain boat balance by keeping their eyes out of the boat so they are able to anticipate changes in pressure on the sails. The result is the helm constantly playing the mainsheet, and the crew adjusting their weight to maximize potential acceleration, and minimize potential deceleration.

## COACHES CORNER—BALANCE

New sailors are typically very stationary in the boat while they focus on steering and course sail trimming skills. Getting their eyes out of the boat to watch the water, and understanding how to react to changes in wind speed will be an ongoing process for the remainder of their sailing career. As a sailor grows accustomed to playing their mainsheet to maintain boat balance, they can then work on incorporating hiking and body adjustments into their technique. With practice they will eventually learn when to ease (and how much), how hard to hike, and when to trim to maximize acceleration.

Balance drills typically require a large course, or an open drill that provides sailors with the opportunity to sail in a variety of gusts and lulls while sailing upwind and downwind. Once sailors have a working knowledge of maintaining boat balance, it should be passively coached as part of every drill.



A skill that is actively coached during a water session is one of the main teaching points for the practice (eg, tacking—footwork, tiller exchange, communication).

A skill that is passively coached is one which can be incorporated into other drills without being a distraction from the main teaching points (eg, while sailors are practicing tacking on a WW/LW course, they can also practice downwind sail trim on their way to the leeward mark).

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## SHEETING AND POINTS OF SAIL

### POINTS OF SAIL

#### Port and Starboard Tack

Identifying the tack a sailboat is sailing is a fundamental skill that is applied every time sailors go on the water. The following are definitions that can assist in determining whether a sailboat is on a port tack or a starboard tack.

**Tack.** The side of the sailboat opposite the boom.

**Port tack.** Sailing with the boom on the starboard side.

**Starboard tack.** Sailing with the boom on the port side.

#### Sail Trim and Points of Sail

Identifying the points of sail is a skill from which the foundation is laid for future on-the-water sail training. The points of sail are as follows:

**Irons.** The bow of the sailboat is pointed directly in the wind and temporarily unable to turn onto either tack.



Sailors will often turn head to wind to stop their sailboats quickly, however will scull their rudder and use their sails at the last second to avoid becoming "stuck in irons".

**Close hauled.** Sailing as close to the wind as possible with sails filling in order to approach an upwind destination.



**No-go zone.** The area in which a sailboat cannot sail upwind even when sailing close hauled. Typically, this would extend 45 degrees from either side of irons.

**Close reach.** Sailing on a point of sail above a beam reach (90 degrees to the wind), but lower than the close hauled position.

**Beam reach.** Sailing a course approximately 90 degrees to the wind.

**Broad reach.** Sailing with the wind coming over one corner of the stern.

**Running free.** Sailing directly away from the wind.



A sailboat that is running free is often referred to as being "on a run".

**Sailing by the lee.** Sailing on a point of sail above a run with the wind on the same side as the boom.

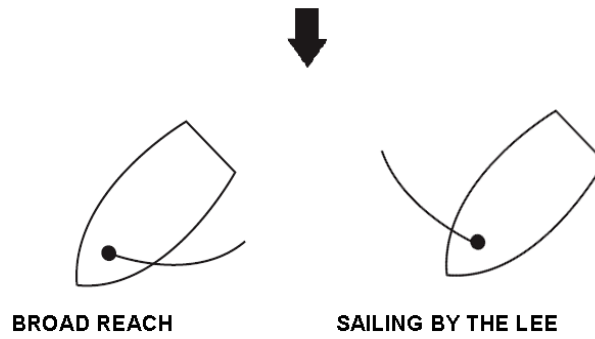


Figure 10 Sailing by the Lee

Note. From *White Sail Workbook*. Canadian Yachting Association. (2007). Manuscript in preparation.

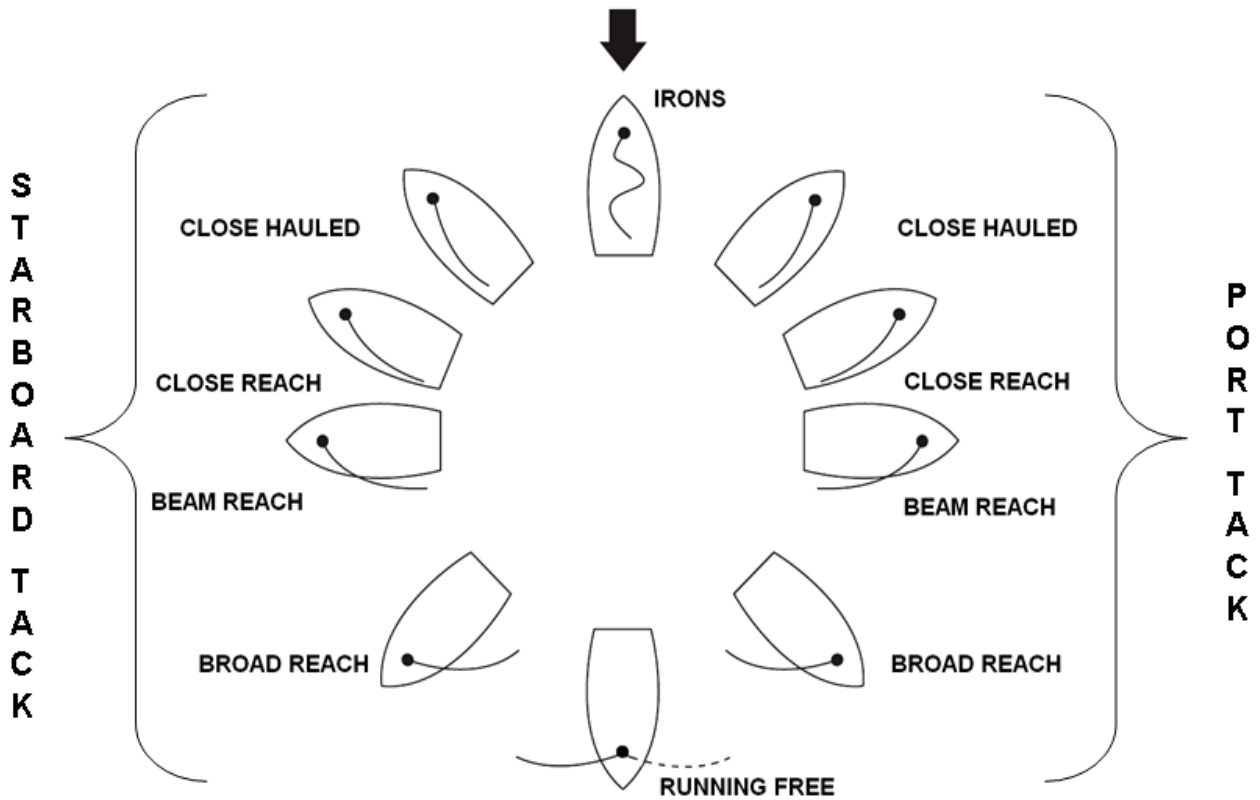


Figure 11 Points of Sail

Note. From *White Sail Workbook*. Canadian Yachting Association. (2007). Manuscript in preparation.

**FOILS**



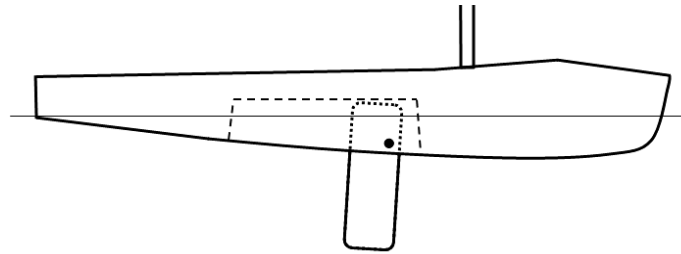
**Leeway.** Side slipping motion of a sailboat.



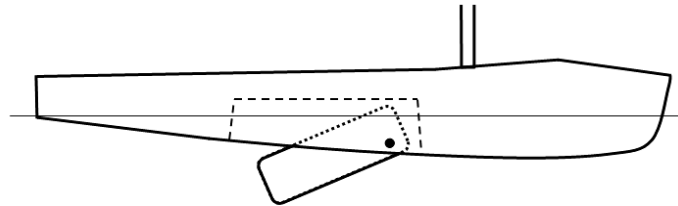
Leeway occurs, most evidently, when a sailboat is sailing on a close hauled course. As a result of the wind blowing from the side, the sailboat will side slip to leeward or away from the wind. As the sailboat bears away onto a reach or run the sailboat will experience increasingly less leeway. While on a beam reach, broad reach, and run, raising the centreboard / daggerboard (foil) out of the water (as illustrated in Figures 12 and 13) will reduce drag and allow the sailboat to go faster.



It is important not to raise the foil all the way out of the water as steering will become difficult. As well, the sailboat will be more difficult to right if it capsizes.



Centreboard is All the Way Down



Centreboard is Raised Halfway

Figure 12 Centreboard Adjustments

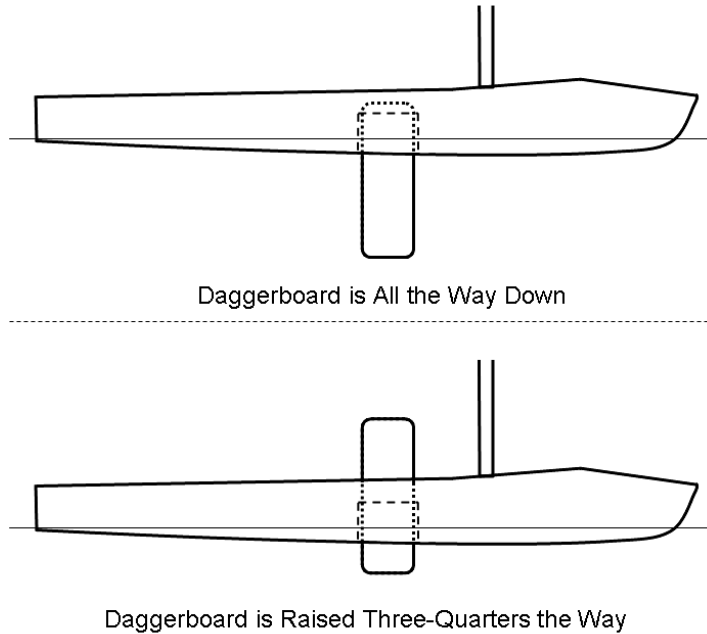


Figure 13 Daggerboard Adjustments

The foil adjustments to make while on different points of sail are as follows:

**Close hauled.** Foil is all the way down.

**Close reach.** Foil is all the way down.

**Beam reach.** Foil is raised halfway.

**Broad reach.** Foil is raised three-quarters the way.

**Running free.** Foil is raised three-quarters the way.

**Sailing by the lee.** Foil is raised three-quarters the way.

## WIND SHIFTS

### WIND SHIFTS

Gusts and lulls which can be seen as dark or smooth patches of water, often result in a change in wind direction:

- **Lift.** Allows the sailboat to head up or ease sails. Typically comes down from the windward side of the bow, leeward jib telltales (ticklers) begin to wave erratically.
- **Header.** Forces the sailboat to bear off or trim sails. Typically comes down from the front of the bow, windward jib telltales (ticklers) begin to wave erratically.

### Upwind

When sailing upwind, the crew should have the jib sheet cleated, allowing the helm to steer close hauled by the jib luff telltales (ticklers). The crew keeps their eyes out of the boat and watches for gusts and lulls approaching from the bow, and communicates approaching changes in pressure and anticipated shift type to the helm. As the sailboat enters the gust / lull, the helm plays the mainsheet to maintain boat balance while using controlled tiller movements to adjust for the header / lifter.



When sailing upwind, a lifter will allow the sailboat to sail closer to the mark, and a header will force the sailboat to sail further away from the mark.

Sailors can improve their upwind progress by tacking on headers; allowing them to sail on the lifted tack.

### Downwind

When sailing downwind, the helm keeps their eyes out of the boat and watches for gusts and lulls approaching from the side and stern, and communicates approaching changes in pressure and anticipated shift type to the crew. As the sailboat enters the gust / lull, the helm plays the mainsheet to maintain boat balance and both sailing partners adjust sail trim for the header / lifter.

## COACHES CORNER—POINTS OF SAIL AND WIND SHIFTS

Basic sail coaches typically prefer tightly grouped closed drills (buoy drills) because they keep the fleet close together in a controlled environment and facilitate skill repetition and refinement. These types of drills are ideal for developing tacking, gybing and maneuvering skills, however because sailors focus on the upcoming mark and forget to look at the water and sails, closed drills are not necessarily suitable for developing sail trim and balance skills.

When working on maintaining boat balance and sail trim in gusts, lulls, headers and lifters, the goal is to keep the sailboat moving as fast as possible; therefore sailors need the time and space to get their sailboat up to speed and experience the various changes in wind speed and direction while sailing in a straight line.

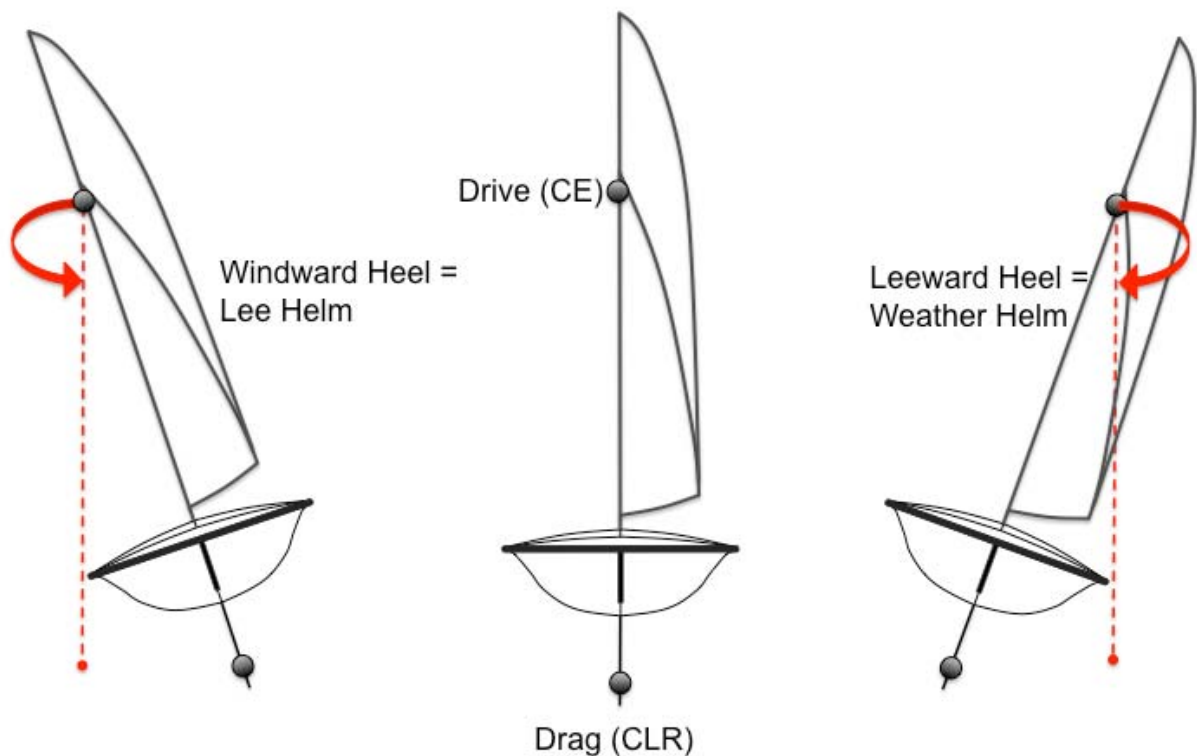
When coaching speed related skills, use large closed drills or open drills that allow sufficient time in-between maneuvers to focus on watching the water, communication, adjusting sail trim and crew weight as changes in the wind occur.

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**STEERING**
**HEEL AND HELM**

Sailors are repeatedly reminded that a flat boat is a fast boat, and when learning to sail upwind sailors also learn that allowing the boat to heel to windward will result in them accidentally becoming stuck in irons; this is because heel has the ability to turn the sailboat. When the hull and rig (sails) are aligned the sailboat wants to sail straight; however when the sailboat heels, the rig turns into a lever causing the sailboat to head up and bear off.

- **Neutral helm.** The tendency for a sailboat to want to go straight.
- **Weather helm.** The tendency for a sailboat to want to head up.
- **Lee helm.** The tendency for a sailboat to want to bear off.



Misaligned drag and driving forces result in weather or lee helm

Figure 14 Crew Weight Windward and Leeward

When the rudder is used to turn the sailboat, it does so by creating drag. By maintaining a flat boat, sailors can keep the boat going straight without using the rudder. Sailors can also use crew weight to

intentionally heel to windward or leeward to assist with heading up and bearing away and reduce the amount of rudder movement required to complete the maneuver.

- **Leeward heel.** Induces weather helm and causes the sailboat to head up.
- **Windward heel.** Induces lee helm and causes the sailboat to bear off.

## COACHES CORNER—HEEL AND HELM

### HEADING UP

Most novice sailors have accidentally ended up in irons because of excessive heel, so using leeward heel to head up typically comes naturally. Novice sailors in fact tend to be very eager to use leeward heel, which often results in the leeward gunwale being buried in the water, and cockpit filled with water.

Excessive heel slows the sailboat down by dragging the gunwale in the water, and increases leeway by reducing the depth of the foils in the water. By using the naturally occurring heel caused by the pressure in the sails, sailors are able to induce heel simply by reducing their hiking (depending on wind speed), and shifting their torso slightly inboard. Sailors should be coached to resist the urge to look at the leeward gunwale, and instead focus on looking at the bow so they can see how quickly the sailboat is turning and match sail trim to the rate of turn.

### BEARING OFF

Bearing off using heel is a very unnatural feeling for novice sailors because of the feeling that they will fall into the water, or that the rig will come down on top of them. Just as watching the bow will help prevent sailors from burying the gunwales to leeward; watching the bow while bearing off will allow them to focus on the rate of turn, and less on the angle of the rig above them. With practice, sailors will become more and more comfortable with heeling the boat to windward.

The footwork when heeling to windward is unique because as the boat heels it becomes difficult for sailors to pull their body back into the cockpit with the hiking straps (as they normally would when hiking). Sailors need to hike hard to initiate windward heel, but when a heel angle is established it can usually be maintained simply by staying on the windward gunwale. Depending on wind speed, sailors can give themselves added stability by removing one or both of their feet from the hiking strap, and bracing their foot / feet against the buoyancy tank directly below them; this will give them something solid to push against when moving inboard to flatten out the boat.

**TACKING****TACKING**

<b>Helm Skills</b>	<b>Crew Skills</b>
Communicate tack with partner.	Confirm tack with sailing partner.
Perform shoulder check (to windward) for other boats and sight line coming out of the tack.	
Sit up straight and move aft (clear of bridle and mainsheet).	Crew counts in tack.
Helm gently heads up.	Crew keeps boat flat, holds jib sheet with aft hand.
As boom crosses boat, helm runs aft hand up tiller extension to universal.	As jib begins to back, crew uncleats it and lets go of sheet.
Helm crosses boat with aft foot first (facing forward) and punches tiller extension to other side of the boat.	Crew crosses boat and quickly trims new jib sheet to bring jib to new leeward side.
Helm sits and smoothly straightens tiller.	Crew sits and trims jib.
Helm switches tiller by reaching back to tiller extension with mainsheet hand to hold both main and tiller extension in mainsheet hand. Then old tiller hand reaches around to take mainsheet. Finally, the tiller extension is flipped over the helm's shoulder so that it is in their lap.	



The crew will maintain a lookout throughout the tack.

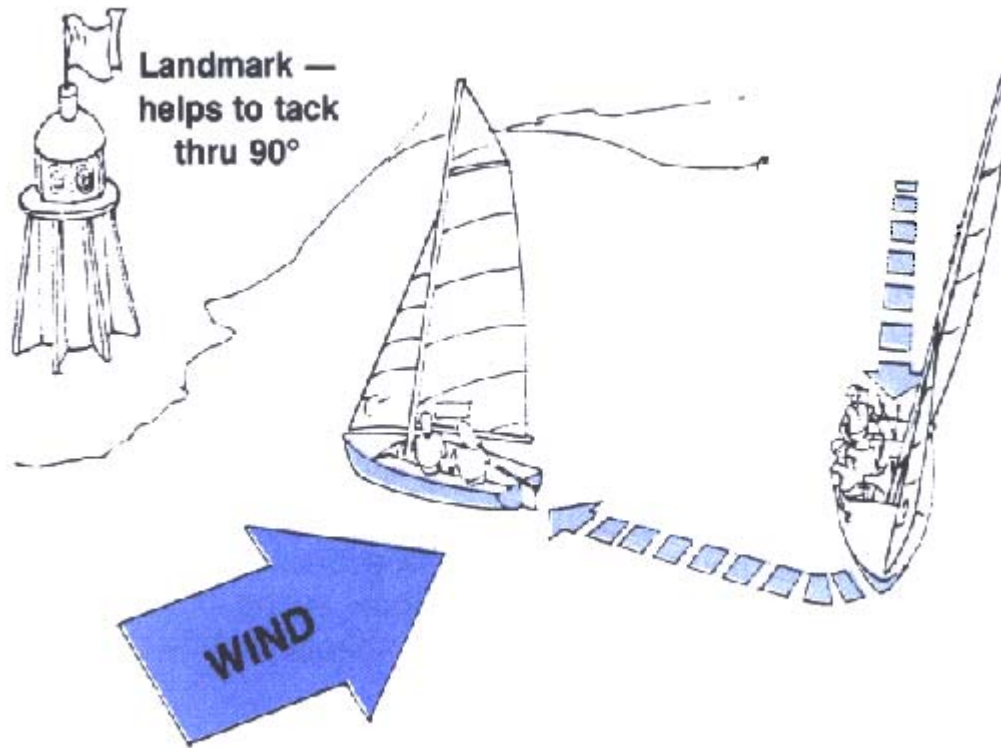


Figure 15 Landmarking

*Note.* From *Basic Sailing Skills Manual* (p. 78), by S. Donaldson, 2001, Kingston, ON: Canadian Yachting Association. Copyright 2001 by Canadian Yachting Association.

## COACHES CORNER—TACKING

Tacking involves a complex series of movements, which are gradually refined over the course of CANSail training.

- **Sight the tack.** The tacking angles in dinghies tend to be  $90^\circ$  which allows the helm to plan the exit of the tack before heading up. When preparing to tack the helm performs a shoulder check to ensure there are no boats to windward, and plan on tacking for an upcoming gust or the windward mark by land marking  $90^\circ$  from the middle of the windward gunwale.



The pivot / turning point for most dinghies is approximately where the helm sits while sailing upwind. The helm can quickly landmark from the windward gunwale by looking directly over their shoulder from where they are sitting.

- **Eyes out of boat.** It is important for the helm to keep their eyes forward on the jib to see what is happening with the sailboat in relation to the wind direction. By looking at the jib, the helm is able to see how quickly the sailboat is turning, and anticipate when they will need to switch sides and straighten their tiller. Helms who keep their eyes out of the boat are less likely to



over- or under-steer when tacking.

- **Footwork.** It is not possible to look forward at the jib sail if the helm faces backwards. By crossing the boat with the aft foot first, the helm is forced to stay looking forward throughout the manoeuvre.
- **Back the jib.** Backing the jib in a tack helps steer the boat through the wind and reduces the amount of tiller movement required by the helm. The crew should keep the jib backed throughout the tack and trim the new jib sheet as the mainsail fills.
- **Tiller.** As crews become more efficient at using crew weight to induce weather helm, and backing the jib through the tack, the helm is forced to use increasingly less tiller. The helm should focus on guiding the tiller into the tack, and straightening the tiller in a smooth movement that allows for a smooth exit from the tack.
- **Exit the tack as entered.** The sitting positions after a tack will be the same as before. For example, if the crew was sitting on the leeward side (for balance) before a tack, they will likely need to sit slightly to windward while the boat accelerates and once the manoeuvre is complete the crew should sit on the new leeward side.

**GYBING****GYBING**

Helm Skills	Crew Skills
Communicate gybe with partner.	Confirm gybe with sailing partner.
Check under boom for other boats and sight line coming out of the gybe.	
Sit up straight and pre-gybe the tiller extension so that it is on the other side of the mainsheet.	
Helm gently bears off.	Crew keeps boat flat, uncleats jib sheet.
As the top of the battens on the mainsail begin to flick, helm grabs mainsheet and uses it to gybe the boom.	In a doublehanded boat, crew watches for the top battens on the main to flick and then gybes the main using the boom vang.
Helm crosses boat with aft foot first (facing forward).	Crew crosses boat and trims new jib sheet.
Helm sits and smoothly straightens tiller.	
Helm switches tiller by reaching back to tiller extension with mainsheet hand to hold both main and tiller extension in mainsheet hand. Then old tiller hand reaches around to take mainsheet. Finally, the tiller extension is flipped over the helm's shoulder so that it is in their lap.	



The crew will maintain a lookout throughout the gybe.

**COACHES CORNER—GYBING**

Like tacking, gybing involves a complex series of movements, which are gradually refined over the course of CANSail training.

- **Sight the gybe.** When reaching, helms use the 90° trick as a point of reference for planning the exit of their gybe. When preparing to gybe, the helm performs a shoulder check to ensure there are no boats to leeward, and plans on gybing for an upcoming gust or the gybe / leeward mark by land marking 90° from the middle of the leeward gunwale.
- **Eyes out of boat.** It is instinct for sailors to look inside the sailboat when performing manoeuvres; however there is little of importance to look at while completing a tack or gybe. It is important for the helm to keep their eyes forward on the jib to see what is happening with the sailboat in relation to the wind direction. By looking at the jib, the helm is able to see how quickly the sailboat is turning, and anticipate when they will need to switch sides and straighten their tiller. Helms who keep their eyes out of the boat are less likely to over- or under-steer when gybing.

- **Footwork.** It is not possible to look forward at the jib sail if the helm faces backwards. By crossing the boat with the aft foot first, the helm is forced to stay looking forward throughout the manoeuvre.
- **Gybing the mainsail.** Gybing can be more intimidating than tacking because of the amount of load on the sail and physical force required to gybe the boom. It can be tempting to slowly guide the boom to the new side, however as wind speed increases and the mainsail loads up slowly guiding the boom can make the manoeuvre more difficult.

Communication between the helm and crew is essential during a gybe. Crews need to watch the leech while bearing off and inform the helm when they are about to gybe the mainsail. Gybing the mainsail with a smooth but quick motion will reduce the amount the mainsail loads up and limit the amount the sailboat heels when the mainsail fills on the new side.



When doublehanded sailing, the helm can anticipate the gybe by watching the clew of the jib sail. When the clew begins to go slack on the jib sheet and flickers slightly to windward, they can expect the crew to gybe the boom very soon.

- **Tiller.** To prevent an eased mainsail from touching the water, it is important for the helm to have a quick transition across the boat during a gybe. Pre-gybing the tiller extension during the bear away reduces the number of movements required during the gybe itself and improves the helm's ability to flatten the sailboat during the exit from the gybe.
- **Gybing the jib.** It is common for new sailors to trim the jib sail in hard after a gybe. After gybing the boom, crews should trim the jib in hard until the manoeuvre is complete and then re-trim for the point of sail
- **Exit the gybe as entered.** The sitting positions after a gybe will be the same as before. For example, if the crew was sitting on the leeward side (for balance) before a gybe, they will likely need to sit slightly to windward while the boat accelerates and once the manoeuvre is complete the crew should sit on the new leeward side.

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## HEADING UP AND BEARING AWAY

Heading up and bearing away involve relatively simple skills, however require teamwork between the helm and crew to be completed effectively.

### HEADING UP

The steps to heading up are as follows:

1. The helm will say, "Heading up."
2. The crew will reply, "Ready."
3. Helm and crew will shift inboard induce a slight amount of heel to leeward, but no more than 15°.
4. The helm will push the tiller slightly toward the mainsail, causing the sailboat to turn toward the wind.
5. Sheeting:
  - a. The helm will trim the mainsheet by pulling in with their forward hand, pass the sheet to their tiller hand and reach down the mainsheet and continue pulling (doublehanded sheeting).
  - b. The crew will sheet in the jib sail as the sailboat turns and keep the tickers flying.
6. The crew will move to the windward gunwale as required to hike.
7. When the bow reaches the new desired course the helm will straighten the tiller and continue sailing.

### BEARING AWAY

The steps to bearing away are as follows:

1. The helm will say, "Bearing away."
2. The crew will reply, "Ready."
3. The helm will clear the mainsheet by raising it above their head lowering their hand towards the mainsheet block (hand-above-head method).
4. Helm and crew will hike to induce a slight amount of heel to windward, but no more than 15°.
5. The helm will pull the tiller slightly toward the windward side, causing the sailboat to turn away from the wind.

6. The helm and crew will sheet out the mainsail and jib sail as the sailboat turns.
7. The crew will move inboard to maintain boat balance as required.
8. When the bow reaches the new desired course the helm will straighten the tiller and continue sailing.

## COACHES CORNER—HEADING UP AND BEARING AWAY

Heading up and bearing away appear to be simple skills, however to be performed in proper sequence and while maintaining boat speed, it involves the combination of tiller control, sail trim, crew weight / heel, footwork and wind awareness.

As sailors become more confident in their helming skills they have the tendency to turn more and more aggressively which just results in buried gunwales and stalled foils. Coaching heading up and bearing off can be accomplished using a technique called chaining. The chaining technique begins with developing the foundation skills and adding components to the technique as the sailors become ready. Using the chaining technique, heading and bearing away can be taught in three stages:

1. **Rate of turn and sheeting.** Especially when heading up, the faster a boat turns, the more it slows down. Have the sailors practice heading up and bearing away while focusing on maintaining a flat and fast boat. Have the sailors match sail trim to the rate of turn, using the hand-above-head method when easing the mainsheet, and doublehanded sheeting when heading up
2. **Route planning.** The ability to accurately plan a route when heading up and bear away is an essential skill when performing mark roundings and when stopping at a point. When heading up or bearing away from a mark, sailors combine route planning skills to pass within one boat length of a mark, with the rate of turn and sheeting skills required to maintain a fast and controlled sailboat.
3. **Tiller reduction.** Once sailors are comfortable with the boat handling and route planning skills involved with heading up and bearing away, they can then begin to reduce the amount of tiller required by introducing heel. The intension of introducing heel is not to make the boat turn faster. Instead the intension is to reduce drag while having roughly the same rate of turn by inducing weather or lee helm with no more than 15° of heel.

## STOPPING

### STOP A SAILBOAT AT A POINT

Stopping is performed to stop a sailboat at a predetermined point such as at a control position, at a mooring ball, or on a start line. The distance required to stop will vary depending on the point of sail, wind speed and wave conditions. Sailors can vary the rate at which they stop by easing head to wind, or by quickly rounding up and backwinding the mainsail.



**Luff.** To cause a sail to flutter by heading up or easing the sheet.

**Luff up.** To head up, causing the sails to flutter.

**Skull.** To pump the rudder as a way to turn the sailboat when it is not making way.

The steps to stopping at a point are as follows:

1. The helm will say, "Prepare to luff up."
2. The crew will reply, "Ready."
3. The helm will say, "Luffing."
4. The helm will push the tiller toward the mainsail, causing the sailboat to turn toward the wind.
5. The skipper and crew will dump the sheets.
6. The crew will move inboard to maintain boat balance.
7. When the bow of the sailboat reaches head to wind, the crew backwinds the mainsail causing the sailboat to come to an abrupt stop (use as required).
8. Unless mooring, when the sailboat comes to a complete stop, the skipper will skull the rudder, to bear the sailboat away slightly so it does not become stuck in irons.

If stopping for a control position the sailboats will approach the coach boat to leeward and stop on a starboard luff. To reduce noise and flogging, once the sailboat is stopped the crew will backwind the jib and the helm hold the sailboat in position by moving the tiller all of the way to leeward.



The route and distance required to stop varies depending on the sailboat class, wind, waves, carried boat speed and point of sail. Sailors should use these steps as a guide, but understand that a number of factors must be considered when planning to stop a sailboat.

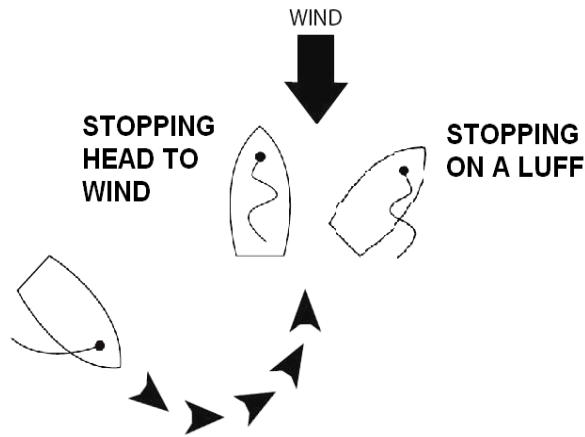


Figure 16 J-Approach

Note. From *White Sail Workbook*. Canadian Yachting Association. (2007). Manuscript in preparation.



Figure 17 Head to Wind (Irons)

Note. From *White Sail Workbook*. Canadian Yachting Association. (2007). Manuscript in preparation.



Figure 18 Luffing

Note. From *White Sail Workbook*. Canadian Yachting Association. (2007). Manuscript in preparation.

## COACHES CORNER—STOP A SAILBOAT AT A POINT

Getting a fleet of basic sailors together in a control position can be a very frustrating skill to teach, however it is an essential skill to master in order to effectively receive feedback from coaching staff. Ideally this skill should initially be practiced on a light wind day allowing sailors to grow comfortable luffing in a fleet at low boat speeds.

When coaching on a large course, or on a windy day it can take several minutes to gather the entire fleet in one location, making where and when to call a control position important. As a rule of thumb,

always call a control position when at the windward end of the course and use the coach boat throttle to keep the fleet as windward as possible until you are ready to provide feedback. With jib sails backed, the fleet will drift downwind quickly so by starting at the windward end of the course, it will increase the likelihood that the fleet will not have drifted all of the way to the leeward mark before the end of the control position.



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## STARTING

### STARTING

When starting / accelerating the helm and crew must identify any obstructions to ensure a safe path for the sailboat, and identify the wind direction in relation to the sailboat so its heading can be adjusted accordingly.

The steps to starting / accelerating a sailboat include:

1. **Identify a safe path and the wind direction.** Prior to sheeting in, the helm and crew will scan the area to locate other sailboats and other obstructions and plan a path based on the wind direction.
2. **Backwind the jib sail.** The crew will backwind the jib sail opposite the desired direction of the turn (backwind to starboard to turn the sailboat to port).
3. **Backwind the mainsail.** The helm or crew (based on sailboat type) will backwind the mainsail in the desired direction (backwind to port to turn the sailboat to port).
4. **Skull the rudder.** The helm will skull the rudder to assist with turning the sailboat.
5. **Backward steering.** When the mainsail is backwinded, the sailboat will begin to sail backwards. When the helm feels the boat begin to move, they will help turn the sailboat by moving tiller onto the same side as the mainsail.
6. **Sheet in.** When the wind starts blowing over the side of the sailboat, the crew will release the backwinded jib, the helm will centreline the tiller and the sailors will sheet in both sails together.

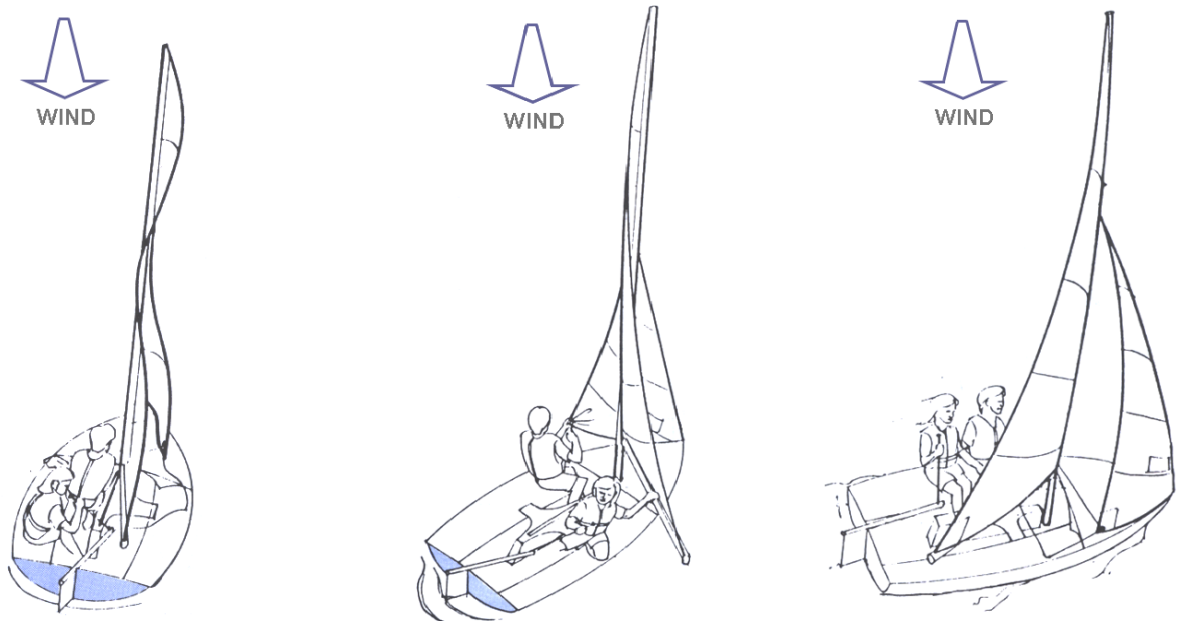


Figure 19 Sailing Out of Irons

*Note.* From *Basic Sailing Skills Manual* (p. 64), by S. Donaldson, 2001, Kingston, ON. Copyright 2001 by Canadian Yachting Association.

## COACHES CORNER—STARTING

Starting / accelerating incorporates communication between sailing partners, awareness of wind direction, sail trim and reacting to changes in boat balances as the sails are trimmed in. For this reason it is very important to instill good habits in sailors when they are first introduced to the skill.

- **Eyes out of boat.** When preparing to accelerate the helm should be looking towards the bow to maintain awareness of wind direction, at the same time the crew should be looking around the jib sail, under the boom and behind the sailboat to look for other sailboats and potential obstructions.
- **Tiller.** It is common for new sailors to get confused when steering backwards during this manoeuvre. If the sailors are having difficulty with the skill, have them practice sailing straight backwards. With practice, they will become more comfortable with tiller movements while sailing backwards at low speed.
- **Backing Sails.** In most types of dinghies, the jib's ability to steer the sailboat is highest when boat speed is slow (when luffing and tacking), whereas the mainsail is most effective when the sailboat is up-to-speed or when head to wind.

When pointed into the wind, the helm or crew backwinds the mainsail to the side of the sailboat they wish to exit head to wind; this will cause the sailboat to slowly bear away onto the desired tack. As the sailboat bears away, the helm / crew will feel a reduction in pressure on the boom (caused by the wind), which is an indication that the mainsail is losing its ability to turn the

sailboat. When pressure on the boom is reduced, the mainsail can be released and allowed to luff; the helm can then pull the slack out of the mainsheet.

When the mainsail is backwinded, the crew looks forward and watches the jib sail as it luffs down the centreline of the sailboat. As the mainsail bears the sailboat away and the jib sail luffs onto one side, the crew backwinds the jib to pull the bow down faster, and allow the boom to be released. The crew keeps the jib backed until the main begins to fill, releases the backed sheet and the mainsail and jib sail are trimmed in together.

- **Boat Balance.** In order to maintain boat balance when accelerating, crews must anticipate changes in heel when the sails are sheeted in wind. With proper communication between sailing partners, crews are able to adjust their body position as the sails fill in order to keep the sailboat balanced.

## THE RACING RULES OF SAILING

### PART 2, SECTION A—RIGHT OF WAY

The sport of sailing is governed by the *Racing Rules of Sailing*, which are governed and updated every four years by the International Sailing Federation (ISAF). There are four board rules in *Racing Rules of Sailing*, which address who has the right-of-way and who needs to *keep clear*. When boats meet, the right-of-way boat shall hail to the *keep clear-boat* as required, however the right-of-way boat shall make every effort required to avoid a collision and damage.

#### 10. On Opposite Tacks

When boats are on opposite tacks, a port-tack boat shall *keep clear* of a starboard-tack boat.

#### 11. On the Same Tack, Overlapped

When boats are on the same tack and *overlapped*, a windward boat shall *keep clear* of a leeward boat.

#### 12. On the Same Tack, Not Overlapped

When boats are on the same tack and not *overlapped*, a boat clear astern shall *keep clear* of a boat *clear ahead*.

#### 13. On the Same Tack, Not Overlapped

After a boat passes head to wind, she shall *keep clear* of other boats until she is on a close-hauled course. If two boats are subject to this rule at the same time, the one on the other's port side or the one astern shall *keep clear*.



A right-of-way boat shall avoid contact if it is reasonably clear that the other boat is not keeping clear.

### COACHES CORNER—PART 2, SECTION A—RIGHT OF WAY

Understanding how to apply the *Racing Rules of Sailing* is an invaluable skill, which will be used by sailors throughout their training and racing careers.



The video located at the following link will help illustrate the *Racing Rules of Sailing*:  
<http://www.youtube.com/watch?v=f17T2uQXUp8>

*Note. Retrieved February 2013.*

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## GLOSSARY

**Batten.** Stiff wood or plastic strip used to support the trailing edge of a sail.

**Batten pocket.** Slots sewn in the leech where battens are inserted to maintain the proper shape of the mainsail.

**Beam reach.** Sailing a course approximately 90 degrees to the wind.

**Broad reach.** Sailing with the wind coming over one corner of the stern.

**Bolt rope.** Rope sewn along the luff and the foot of a mainsail which slips into a groove in the spars.

**Boom vang.** Tackle leading downward from the boom which controls the mainsail shape by adjusting the tension on the trailing edge. Boom vang tension will also prevent the boom from slipping off the gooseneck.

**Boom.** Horizontal spar at the bottom of the mainsail.

**Bow.** Front of the sailboat.

**Bowline.** Makes a non-slip loop in the end of a line. Used to tie the painter to a bow ring, for attaching sheets and halyards to sails, and for many other purposes.

**Centreboard.** A blade of wood, fibreglass or metal fixed to the sailboat that pivots through a slot in the bottom of the sailboat to prevent sideslipping while sailing. It is similar in function to a daggerboard.

**Cleats.** Fittings that grip and hold lines.

**Clew.** Lower, aft corner of a sail.

**Close hauled.** Sailing as close to the wind as possible with sails filling in order to approach an upwind destination.

**Close reach.** Sailing on a point of sail above a beam reach (90 degrees to the wind), but lower than the close hauled position.

**Cringle.** Reinforced ring on the corners of a sail to which a line is attached.

**Daggerboard.** A blade of wood, fibreglass or metal that extends and retracts vertically through a slot in the bottom of the sailboat to prevent sideslipping while sailing. It is similar in function to a centreboard.

**Fairlead.** Ring or U-shaped fitting which guides a control line and helps prevent tangles.

**Figure eight.** Used as a 'stopper knot' to prevent a line from slipping through a block or fairlead.

**Figure eight through a bight (racing knot).** A bight passed through a grommet or cringle, which is secured in place by the standing end of the line with a figure eight knot. A low profile knot which is ideal for securing halyards.

**Fog.** A thick cloud of water near the Earth's surface. Fog reduces visibility making it difficult to navigate.

**Foot.** Lower edge of a sail.

**Geographic hazards.** Naturally occurring obstructions that pose a safety concern to a vessel.

**Gooseneck.** Attachment used to connect the boom to the mast.

**Gust (synonym—puff).** An abrupt increase in wind speed, which appears on the water's surface as dark, rippled patches.

**Hanks.** Metal or plastic fitting used to secure the jib sail to the forestay.

**Head.** Upper corner of a sail.

**Header.** Forces the sailboat to bear off or trim sails. Typically comes down from the front of the bow, windward jib telltales (ticklers) begin to wave erratically.

**Heat-related illness.** The condition of having an abnormally high body temperature. This is caused by prolonged exposure to extreme heat or heavy exertions in a hot environment, both of which can occur when sailing

**Hiking strap.** Foot straps which enable the skipper and crew to lean back further without falling overboard.

**Hull.** Main shell or body of the sailboat.

**Hypothermia.** The condition of having an abnormally low body temperature. This is caused by exposure to cold air temperature or cold water, both of which can occur when sailing.

**Irons.** The bow of the sailboat is pointed directly in the wind and temporarily unable to turn onto either tack.

**Jib halyard.** Control line used to hoist the jib sail and hold it up.

**Jib sail.** Small sail set ahead of the mast.

**Jib sheet.** Line used to control the jib sail. The jib sheet can be pulled in or eased out to trim the jib sail.

**Leech.** Aft edge of a sail extending from the head to the clew.

**Lee helm.** The tendency for a sailboat to want to bear off.

**Leeway.** Side slipping motion of a sailboat.

**Lift.** Allows the sailboat to head up or ease sails. Typically comes down from the windward side of the bow, leeward jib telltales (ticklers) being to wave erratically.

**Line squalls.** A sudden and short-lived gust of wind. Line squalls can be identified by a fast approaching line of dark water.

**Luff.** Forward edge of a sail extending from the head to the tack.

**Luff.** To cause a sail to flutter by heading up or easing the sheet.

**Luff up.** To head up, causing the sails to flutter.

**Lull (synonym—hole).** An abrupt decrease in wind speed, which appears on the water's surface as a smooth or glassy area.

**Main halyard.** Control line used to hoist the mainsail and hold it up.

**Mainsail.** Large sail set behind the mast.

**Mainsheet.** Line used to control the mainsail. The mainsheet can be pulled in or eased out to trim the mainsail.

**Mast.** Vertical spar that holds up the sails.

**Navigational hazards.** Man-made obstructions that pose a safety concern to a vessel.

**Neutral helm.** The tendency for a sailboat to want to go straight.

**Outhaul.** Control line that attaches the clew of the mainsail to the boom and tensions the bottom of the mainsail.

**Port tack.** Sailing with the boom on the starboard side.

**Reef knot.** Used to join two lines of the same diameter and type (eg, manila, polypropylene, etc.)

**Rudder.** Hinged blade mounted to the outside, flat section of the stern, used for steering.

**Running free.** Sailing directly away from the wind.

**Sailing by the lee.** Sailing on a point of sail above a run with the wind on the same side as the boom.

**Skull.** To pump the rudder as a way to turn the sailboat when it is not making way.

**Starboard tack.** Sailing with the boom on the port side.

**Stern.** Back of the sailboat.

**Tack.** Lower, forward corner of a sail.

**Tack.** The side of the sailboat opposite the boom.

**Thwart.** Supports the top of the centreboard housing and provides a seat.



**Tiller extension.** Handle attached to the end of the tiller which allows the skipper to sit further ahead and outboard to help stabilize the sailboat.

**Tiller.** Handle attached to the top of the rudder which is used to steer the sailboat.

**Transom.** Flat portion of the hull that spans the stern of the sailboat.

**Weather hazard.** A meteorological event which poses a safety concern to a vessel.

**Weather helm.** The tendency for a sailboat to want to head up.