RYA SailFoil Instructor Guide

RYA Sailing Scheme: Foiling courses 2018

	First Flights	Sustained Flights	Performance Flights
Current level of recognition required	RYA Level 2, Basic Skills	RYA First Flights	RYA Sustained Flights
Course name	RYA SailFoiling First Flights	RYA SailFoiling Sustained Flights	RYA SailFoiling Performance Flights
Course type	Taster Session	Course	Course
Course description	A first taster and introduction to foiling. This is the first course in the RYA SAILfoil scheme, providing you with a basic introduction to foiling, assisting you to make your first foiling take off.	This course is designed to increase your foil handling and control. After completing this course you will start to feel more confident about the practical techniques and theory required to foil, steer and maintain a course effectively	The last of the foiling courses, looking at advanced skills and technique. This course will increase your confidence in foiling at different angles, whilst also looking at entry and exit of manoeuvres, providing you with a good understanding at to the theory of foiling.
Assumed knowledge	Sailing skills to the standard of RYA Level 2, Basic Skills certificate	Sailing skills to the standard of RYA Dinghy Foiling First Flights	RYA Foiling Sustained Flights
Minimum duration	Approximately 2-4 hrs (Taster session)	Approximately 2 days, 16 hrs or equivalent number of sessions	Approximately 2 days, 16 hrs or equivalent number of sessions
Minimum age	None	None	None
Course content	Provides a basic introduction to foiling, equipment and basic knowledge required to assist you in making your first foiling take off.	This course looks to increase your confidence and ability in techniques and theory required to foil, steer and sustain foiling effectively, (all transitions will be non-foiling).	Concentrating on advancing skills and technique, as well as foiling knowledge, this course builds your confidence in a variety of foiling angles, whilst also developing the skills for the entry and exits of manoeuvres
Ability after course	First foiling flights	Confidence maintaining and sustaining flight	More advanced flight control, manoeuvres, and techniques
Equipment	Adapted and foil designed boats	Adapted and foil designed boats	Foil designed boats only

RYA Windsurfing Scheme: Foiling courses 2018

	First Flights	Sustained Flights	Performance Flights
Current level of recognition required	RYA Intermediate Windsurfing	RYA First Flights	RYA Sustained Flights
Course name	RYA Windfoiling First Flights	RYA WindFoiling Sustained Flights	RYA WindFoiling Performance Flights
Course type	Taster Session	Course	Course
Course description	A first taster and introduction to foiling. Designed as an initial taster, this course will provide you with a basic introduction to foiling and how to make your first foiling take off and glide.	Designed to increase your foil handling and control, taking you from your first take offs to sustained flight. This course aims to increase confidence and comfort surrounding the practical techniques and theory required to foil, steer and maintain a course more effectively, as well as maintaining longer foiling glides.	The last of the foiling courses, looking at advancing your skills and technique. This course looks to take you from sustained flight to controlling the foil with confidence in a wider range of conditions and sailing angles. You will be entering transitions foiling, building the skills to try foil gybes!
Assumed knowledge	RYA Intermediate windsurfing certificate, comfortable blasting in both straps.	Sailing skills to the standard of RYA Windsurfing Foiling First Flights.	Sailing skills to the standard of RYA Foiling Sustained Flights.
Minimum duration	Approximately 2-4 hrs (Taster session)	Approximately 2 days, 16 hrs or equivalent number of sessions.	Approximately 2 days, 16 hrs or equivalent number of sessions.
Minimum age	None	None	None
Course content	Provides a basic introduction to foiling, seeing you take your first flights, as well as provide you with basic foiling knowledge to assist you.	This course looks at building on techniques and theory required to maintain and sustain foiling effectively, (all transitions will be non-foiling).	This course advances your foiling skills and techniques, looking at increased control and building sailing confidence for foiling transitions
Ability after course	First foiling flights.	Confidence maintaining and sustaining flight.	Increased confidence and competence, advanced flight control, manoeuvres and techniques.

RYA Foiling Syllabus

RYA SAILFoiling Syllabus

RYA First Flights

Taster session

This introduction session in the RYA SAILfoiling provides you with a basic introduction to foiling, assisting you to make your first foiling take offs.

As a pre-requisite you should hold the RYA Level 2 Basic Skills certificate. Suggested course length: 2 - 4 hours (Taster Session)
Delivered by: RYA Foiling Instructor (Sustained flights competency)
Ratio: max 1:4 Instructor:Student, (max 2 boat)

Practical

Rigging

Has knowledge of:

- assembling and setting up the main foil, rudder and rudder foil
- various foiling boats
- the options and adaptions available for non-foiling boats

Launching and Recovery

- Has knowledge of the different launch/ recovery methods for different boat designs

Sailing Techniques and Manoeuvres

Can:

- engage and disengage foils
- change course sailed and adjust sail trim to encourage flight
- 'take off'

Understands and has knowledge of:

- how to land safely
- how to maintain foiling
- capsize recovery methods
- apparent wind, showing a basic application and sail adjustment

Foiling Knowledge

Understands and has knowledge of

- the basic theory of how foils work
- a range of different foiling boats
- sail adjustments, and how to trim sails

Safety

Understands and has knowledge of

- the risks of foiling alone
- the lack of noise when approaching other craft
- different personal safety equipment
- importance of foiling in suitable sailing conditions

RYA SAILFoiling Syllabus

RYA Sustained Flights

Aimed to take you from your first take offs, this course you will start to increase your confidence with the practical techniques and theory required to foil, steer and maintain course effectively

(NOTE: Any tacking or gybing at this level is non-foiling)

Assumed knowledge and practical ability on starting this course is RYA First Flights or above

Suggested course length: Up to 16hrs, either spread over a series of sessions or full days

Delivered by: RYA Foiling Instructor (Performance Flights competency)
Ratio: max 1:4

Practical

Rigging

- Can assemble and set up the main foil (with assistance)
- Can assemble and set up the rudder and rudder foil (with assistance)
- Has knowledge of how to adjust foils in different conditions to optimise performance
- Understands how to trim the main foil to adjust the 'ride height'

Launching and Recovery

Can

- launch the boat off a slipway / beach using method specific for that foiling boat (with assistance)
- safely return to slipway/ beach using method specific to that foiling boat

Sailing Technique and Manoeuvres

Can

- maintain periods of sustained foiling
- trim sails effectively according to the apparent wind
- demonstrate a non-foiling tack
- demonstrate a non-foiling gybe
- adjust bow height and trim through the rudder foil
- show basic skills and understanding of foiling on various points of sail

Foiling Knowledge

Technique

- Understands the apparent wind effect and how to trim effectively according to the point of sail
- Understands different ride heights and how to adjust main foil to enable the boat to ride higher or lower
- Has knowledge of correct angles for tack entry and exit
- Has knowledge of correct angles for gybe entry and exit

Theory

Understands

- how the wand works
- how twist tillers adjust the rudder
- righting moment and how it is achieved

Safety

- Has knowledge of safety equipment which may be worn whilst foiling

RYA SAILFoiling Syllabus

RYA Performance Flights

Designed to increase foiling confidence and ability on different angles, whilst building the skills to progress onto foiling manoeuvres. This course provides you with a solid understanding of foiling theory.

Assumed knowledge and practical ability on starting this course will be that of RYA Sustained Flights or above

Suggested course length: Up to 16hrs, either spread over a series of sessions or full days

Ratio: max 1: 4

Delivered by: RYA Foiling Instructor (Performance flights competency)

Practical

Sailing Technique and Manoeuvres

Can

- demonstrate foiling upwind and downwind
- effectively set up, balance and
- demonstrate tack entry whilst foiling, exiting in control

Can

- effectively set up, balance and steer into the gybe
- demonstrate gybe entry whilst foiling, exiting in control

Foiling Knowledge

Can

- steer and adopt the correct body movements required to foil through a gybe
- adjust wand settings and ride height for optimum performance in different conditions

Understands

- the theory and technique required to set up and approach the '*entry*' of a foiling tack and gybe
- the theory and technique required to set up and approach the '*exit*' for a foiling tack and gybe
- what causes and how to deal with a pitch pole (specific boats)
- Has knowledge of different wand systems and what they are used for

Safety

- Understands the importance of safe sailing areas and suitable sailing conditions to assist with the practise of performance foiling manoeuvres

RYA *Sailfoiling*

Operation Guidance

RYA Foiling integration 2018

It's not often I get the opportunity to talk about something new and innovative that sparks excitement and enthusiasm at a new level, and which involves so many people.

Working with an incredible group of people to investigate the integration of foiling into the RYA Sailing and Windsurfing Schemes has been an amazing experience so far, and the excitement just keeps growing, it truly is inspirational times.

I can't wait to see the hard work and dedication people have committed come into fruition, and see foiling delivered through RYA Training Centres, enabling more people to access and experience the amazing feeling.

Amanda Van Santen
RYA Chief Instructor, Dinghy and Windsurfing

Guidance on safe management of foiling at an RYA Training Centre

The following guidance has been put together for the delivery of the RYA Foiling courses at RYA Recognised Training Centres (RTCs), in addition to, and in accordance with, the current RYA Guidance Notes.

The following information states the instructor qualification suggested to deliver the RYA Foiling courses, student:instructor ratios, equipment guidance, as well as other safety and operational support.

Writing your operating procedures

The following is a guide to help you compile your operating procedures, it should not be seen as the 'only' approach, but as an aid, and no way exhaustive in the safe practice and delivery of foiling sessions at an RYA Training centre.

It is important that your documentation records what happens in practise and the information below only assists you in doing this. While it is important to record centre procedures, the emphasis is on establishing and documenting a practical and workable framework under which instructors and students can operate, keeping them as safe as possible. It is not about creating an unworkable and useless mountain of paperwork that nobody can understand.

Centres should risk assess the delivery of foiling and adopt procedures relevant and suitable to their own environment, the experience of their instructors, students and the foiling boats to be used.

For further details on writing training centre operating procedures as part of your safety management system, please reference the guidance document on the RYA Training Support Site.

The following headings are aimed at providing key guidance for the Foiling delivery, in addition to possible structure.

1.1 Introduction:

The courses for the RYA Foiling courses fall under the RYA Sailing and Windsurfing Scheme, and can be delivered to both youth and adults.

It is a requirement for centres wishing to run the RYA Foiling Scheme, to be recognised to deliver the RYA Sailing Scheme up to and including RYA Level 2 - Basic Skills, and RYA Windsurfing Scheme up to, and including RYA Intermediate Planing.

Your operating procedures should provide an overview of the aims and objectives of the foiling courses and tuition being delivered, who will be receiving the tuition, the courses the centre is recognised for, and when/where it is operated.

A brief overview as to the responsibilities of qualified instructors and key 'foiling' instructors, scope of authority and responsibilities within the centre's staffing structure should also be included within your procedures, as well as any additional information or change in the day to day staffing of sessions/courses and information to be contained in staff briefings.

1.2 Certification available
RYA training will determine which Foiling courses are offered depending on equipment and craft available, qualifications and experience of instructors, facilities and operating area.

The centres operating procedures should clearly outline the courses offered, general information, common practice, eg: '***All courses are run by appropriately qualified instructors',*** and any centre specific information rather than required practice.

Below is an outline of the RYA Foiling courses for ***both*** Sailing and Windsurfing :
RYA Foiling Courses:

1. First Flights (Taster session)
2. Sustained Flights
3. Performance Flights

1.3 Minimum Course duration
As this is a scheme, and the syllabus is under trial, it is expected that both 'Sustained Flights' and 'Performance Flights', will take approximately 16 hours, either spread over a series of sessions or two full days, with 'First Flights' seen as the initial taster, delivered over 2-4 hours.

However this is a guide and *not* a stipulation. For example 1:1 tuition may be run over a shorter timeframe than larger groups of 1:4.

1.4 Award criteria
Continual assessment during the course, with the potential for direct assessment if available and appropriate. RYA Foiling certificates are available to recognised training centres, including First Flights Taster.

1.5 Course supervision
As referenced in the Guidance notes, and required for the delivery of the RYA Sailing Scheme, all training activities should be supervised by an appropriately qualified RYA Senior Instructor (SI).

Foiling:

- RYA Dinghy Senior Instructor* - RYA Sailing Scheme
- RYA Windsurfing Senior Instuctor* - RYA Windsurfing Scheme
- RYA Windsurfing Senior Instructor who holds a dinghy Instructor certificate*
- RYA Dinghy Senior Instructor who holds a Windsurfing Instructor certificate*

*for the duration of the it *will not* be a requirement for the Chief Instructor to hold an RYA Senior Instructor qualification and be an RYA Foiling Instructor. However an instructor with foiling experience is an essential pre-requisites for the RYA Scheme, upon approval from RYA Training.

1.5 Minimum instructor qualification and student:instructor ratio

The following table details the minimum instructor qualification, and ratios required for each course, working with supervision as shown above and subject to recognition being held for the course and type of craft.

The RYA Foiling Instructor for both Sailing and Windsurfing is a 4 day endorsement with a prerequisite of a current RYA Dinghy Instructor, or RYA Windsurfing Intermediate Planing instructor with a current and valid First Aid Certificate, and RYA PBL2

The table below provides instructor ratio and equipment information for both RYA Sailing and Windsurfing Foiling:

COURSE	QUALIFICATION	INSTRUCTOR/STUDENT RATIO
RYA First Flights	RYA Foiling Instructor*1 RYA Sustained Flights personal comptency or above*2	Sailing 1:4 Instructor:student, (Max 2 boats)
		Windsurfing 1:4 - (Initial Session with 2 foils to 4 students)
RYA Sustained Flights	RYA Foiling Instructor*1 RYA Performance Flights personal competency or above*2	Sailing 1:4 Max
		Windsurfing 1:6
RYA Performance Flights	RYA Foiling Instructor** RYA Performance Flights personal competency or above*2	Sailing 1:4 Max
		Windsurfing 1:6

***1:** Should a Foiling Instructor not be part of the staff team, the RYA Centre CI or Principal should seek approval from the RYA, submitting credentials of the staff they wish to run the RYA Foiling.

***2:** Suitably experienced 'staff/instructors' can deliver the Sustained Flights and Performance Flights Courses, under the approval of the centre's Principal or Chief Instructor.

1.6 Safety boat guidance

It is planned that further and separate safety boat guidance will be provided within G16, RYA Safetyboat Handbook, in the future revisions

All safety boat drivers should be briefed on the unique challenges that foils in a sailing area present, with particular awareness when pulling away and checking area is clear of craft. Within windsurfing operations, safetyboat drivers should be happy with both alongside rescues and also rescues where equipment is separated.

Careful consideration should be given to the assessment of suitable safetyboat:student ratios according to the chosen craft, powerboat design, characteristics and functionality, as well as being in accordance with RYA Safetyboat requirements. For Sailfoiling, it is suggested a 1:2 ratio for first flights, and 1:4 for courses and training thereafter.

A record of this should be kept within your staff training document.

1.7 Course materials

Students taking their first course within the RYA Foiling scheme, should be provided with the relevant scheme logbook by the RTC: G4 Sailing Scheme; G11 Youth Sailing Scheme; W1 Youth Windsurfing Scheme; G47 Windsurfing Scheme, and RYA Foiling certificates must be issued.

1.8 Training Vessels (Boats, boards and foils)

All equipment (boats, adapted foils and windsurfing boards/foils) must comply with the guidelines set out within this document, and in accordance with the RYA Guidance Notes.

The centre should use this section to make reference to specific '*Foiling equipment*' the centre has, level required to sail them and instructor qualifications required to teach.

You are also required to add foiling into operational areas such as maintenance logs and boat check procedures.

The centre should ensure they have access to sufficient equipment in order to teach all courses for which it is recognised, in accordance with the student:instructor ratios as listed above.

Boats should be equipped to teach the entire relevant syllabus, and in the case of foiling boats, as per high-performance boats, rigging guides should be used where available.

Centres must consider whether a significant risk of entrapment under dinghies exists and train instructors to deal with it as necessary. Centres must consider using masthead floatation for training to reduce/eliminate inversions in deep water. Students must be aware of the risks associated with inversions.

1.9 Equipment

Centres should pay close attention and ensure that equipment is correctly set up in accordance with the manufacturers' or distributor guidance, considering correct board, rig and foil combination.

This should form part of the instructors normal daily session set up, and where necessary, student briefing.

The centre must have access to sufficient equipment in order to teach all courses for which it is recognised, equipped for the entire relevant syllabus according to the conditions. Please see the relevant Training Checklist at the back of this document.

1.10 Operational areas
Careful consideration should be paid to suitable operating area(s) designated to foiling delivery.

For more information, reference the Guidance Notes on operating area limits, using diagrams and charts to define the sailing area with limits and potential hazards clearly marked, as descriptions alone can be confusing. Remembering to include any operating restrictions or other water users with defined areas which instructors need to be aware of.

The following points have been put together to assist the consideration of suitable operating areas for the delivery of foiling courses and taster session:

- Size of area: Large sailing areas are required to operate foiling safely, due to foiling crafts (boats and boards), travelling at high speeds. Consideration should be paid to sailing areas that enable room across wind, upwind and downwind.
    - Beginners require space across the wind as well as downwind
    - As skills develop, downwind space, similar to that required for asymmetrics and planing windsurfers will be required
- Speed and distance covered: Foiling boats and boards can sail at very high speeds, often silently or much quieter, therefore careful consideration must be paid to suitable and sufficient space being made available for students, with *clearly defined* sailing areas, considering across-wind, upwind, and downwind (at speed).
- Briefings: Effective briefs should be provided by the instructors with clear instructions outlining any required information, such as:
    - downwind limit
    - safety boat
    - safe sailing area
- Water depth: Consideration should be paid to the depth of water due to the foil lengths. Therefore sailing areas should have sufficient depth, with any risks from shallow water assessed and included in instructor briefings
    - Flat water is a preference, and should be a priority wherever possible, if conditions prevent this effective procedures should be put in place to manage the situation effectively for the student.
    - **This is especially important when using foiling boats which do not perform well, or become unstable in displacement mode.**

1.11 Safety Considerations
Safety at an RYA Training Centre is paramount, and foiling is a new concept to most RTC environments, as such centres and staff must do all they can to avoid unnecessary risk and manage it effectively.

There are a few specific safety considerations when delivering foiling tuition, due to the different features, systems and ways to set up and rig both foiling boats and boards.

Care and attention should also be paid to the manufacturer's rigging and tuning guides. This will not only ensure safe use of equipment, but also promote best foiling experience through correct set-up.

It is important that the instructors responsible for supervising or running sessions have knowledge of the specific equipment being used, characteristics when stopping and what safety precautions may be necessary.

- The use of helmets should be effectively assessed and be considered
- Instructor briefings should include clear instructions on techniques, avoidance of crashes and what to do in the event of a sudden stop or crash

Personal equipment should be a high consideration, increasing the safe practice. Foils can be sharp and impacts with equipment can occur. As such, effective assessment in to the use of helmets, wetsuits and foot wear should be carried out and suitable guidance provided.

Sudden stops: Unlike traditional planing boards, or modern boats, where students experience capsizes or catapults, students sailing foiling equipment may experience crashes or sudden stopping when learning to foil.

For windsurfing, the use of boots should be effectively risk assessed and considered, and the teaching of holding onto the boom during WINDFoiling should be briefed to students.

Depending on the design, foiling boats can crash in a few different ways and this should be incorporated into staff training and centre procedures.

By checking equipment is rigged effectively and correctly set up according to the manuufacturer's guidance, crashes can be minimised. For example, too much lift on the main foil can lead to the boat leaping out of the water and crashing.

1.12 Session delivery

As with all instructor planning, dynamic risk assessing of sailing areas and weather conditions continue to play an important role when deciding how long your students will be on a foiling session.

It is important to be aware that students who are new to foiling and developing their technique can tire quickly. Consideration through effective session planning should factor in aspects such as the chosen sailing area; session timings; environments for the sailors to rest, or perhaps the delivery through shorter sessions.

Other aspects will also be key contributing factors such as the student’s ability, boat design and limitations - different types of foiling boats and boards can create very different experiences for novice foilers.

Effective staff training should include:

- knowledge on the specific features of the boat/board and foil
- understanding as to correct set-up of both the boat/board and foils

For sailing, specific training is required to ensure staff understand the safety considerations and ways for the foils to disengage if they come into contact with something under the water, or adjustments to the wings enabling righting moment and ease of foiling.

As with all watersports, weather conditions have a huge effect on foiling session delivery: Too little wind, and foiling boats/boards may not lift out of the water, too much wind and they have the potential to be overpowered, which may lead to sudden stops or potentially harming the student or damaging the equipment.

When creating the operational procedures, the operating areas chosen to deliver foiling should be a high consideration:

- Procedure should include the prioritising of flat water where possible
- Knowledge of other water users
- Maximum wind strengths, specific to the type of foiling equipment at the centre, considering the user and their abilities:
    - The chosen equipment should be assessed individually based on their characteristics, with individual guidance for different students capabilities, top wind strengths and water states

1.13 Launching and recovery:

The launching and recovery of foiling equipment, like all centre craft, requires specific training to ensure staff and students do not harm themselves with the equipment, as well as to prevent equipment damage.

Centres should actively assess, produce training procedures and integrate within the centre's staff training specific procedures relating to their operating areas, considering some of the following factors:

- How the foils are rigged onto the boat/board, the affect this has on how it can be launched and recovered, and any pre-flight checks
- Use of suitable areas with sufficient space to ensure the foils can be rigged/ de-rigged and the boat launched/ recovered in a safe environment which minimises risk of harm or damage
- Any assistance or procedure a centre may choose to put in place due to their environment or conditions when teaching beginner or taster session

Remember: Your operating procedures need to be easy to read and understood by your instructors - Lay them out in a logical order

Train your staff in the operation of the centre and add a 'sign sheet' at the beginning of the file to confirm they have read and understood the SOPs, as well as additions made, making them form part of a more comprehensive induction process.

Date the document and amend the date each time the document is reviewed to ensure it stays current.

Your operating procedures are a very important aspect of your training centre's set-up and if written well they will act as a guide to best practise and will ensure that staff are up to speed with the key elements of operation.

RYA Training Checklist: Windsurfing (INC: Foiling)

Ref: TCW

All vessels used for RYA Training must comply with these requirements plus the equipment requirements of the country of operation.

RTC name	
Inspection date	
Inspector's name	

References in the left hand column refer to the Notes section of this form or to the RYA Recognition Guidance Notes

Ref	Item	Check
	BOARDS	
	A Suitable equipment to teach all courses requested	
	B Complete set of equipment for each student	
	C Junior boards, junior rigs in a variety of sizes, suitable fins, rigging sticks	
	BOARDS IN GOOD CONDITION	
	A Hulls in good working order and condition, free from punctures, de-lamination and waterlogging	
	B Effective and securely fixed deck plate	
	C Non-slip surface	
	D Safe facility to enable towing	
	E Daggerboard (if fitted) correctly adjusted, secure in up/down positions, free to move in between, free from sharp edges	
	F Fins, appropriate to board, courses, prevailing conditions, free from sharp edges	
	STORAGE	
	A Safe, secure and easily accessible	
	RIGS IN GOOD CONDIITON	
	A Sails presentable, free from holes and tears, suitable for levels being taught	
	B Mast suitable length, bend characteristic and material for the sail, watertight	
	C Mast bases operate correctly: • Downhaul free to move and cleat • Quick release system	
	D Boom : • secure clamp, doesn't slip but easily adjusted to height of user • correct length for sail • grip surface in good condition	
	UPHAUL	
TCW1	**A** Uphaul* fitted to all rigs	
	DOWNHAUL / OUTHAUL ROPES	
	A Unfrayed **B** Suitable diameter for fittings used	
	BOARD AND RIG JOINT (UJ)	
	A Free from wear	
	B Quick release should be capable of being performed by student whilst afloat	

Ref	Item	Check
	SIMULATOR (basic)	
	A stable, low, well dampened	
	B Board representative of type used afloat	
	• Good non-slip surface • Securely attached	
	C Positioned so students will not injure	
	themselves or others should they fall off	
	RECOGNITION ABOVE START WINDSURFING	
	A Harness lines on boom in sound condition	
	B Range of harnesses in suitable sizes	
	RECOGNTION FOR INT AND ADV: STATIC SIMULATOR FOR TEACHING THE COACHING FORMULA, HARNESS AND FOOTSTRAPS:	
	A Board representative of type used afloat:	
	• Positioned securely • Sail-less rig attached	
	B Device representing the pull of the wind:	
	• Safe and in good condition • Adjustable for difference wind strengths / student size	
	C Positioned so students will not injure themselves or others should they fall off	
	WINDSUPS	
TCW2	• Central fins or equivalent • No more than 50% of course fleet to be WindSUPs	
	FOILING	
	Appropriate to boards being used	
	Appropriate mast lengths and wing sizes	
	Securely fit into fin boxes on boards being used	
	All parts securely fitted	
	Wings secured and well maintained	
	BOARDS	
	Appropriate widths of boards for foils and sail sizes	
	Good range of footstrap spread and adjustment	
	Appropriate precautions taken to secure foils in fin boxes	
	Appropriate volume boards available	
	RIGS	
	Appropriate range of sails available	
	Range of adjustable harness lines	

RYA Training Checklist: Foiling

All vessels used for RYA Training must comply with these requirements plus the equipment requirements of the country of operation.

RTC name	
Inspection date	
Inspector's name	

References in the left hand column refer to the Notes section of this form or to the RYA Recognition Guidance Notes.

Ref	Item	Check
	BOATS AND EQUIPMENT	
	A Suitable and sufficent craft to teach all courses requested	
	B Boats can be rigged to teach all parts of the syllabi	
	C Boats for spinnaker courses in condition and equipped suitably for club racing	
TCD1	**D** Hull: good state of repair and watertight	
	E Fittings and toe straps in good order	
	G Sheets: sufficient length, appropriate diameter and material	
	H No protruding strands in wire rigging **I** Shroud pins and split rings taped	
	L Sails in good condition	
	O Simulator (optional) stable and	
TCD2	functional **R** Good range of harnesses available	
	if trapeze boats present, considering quick release system	
	S Rigging guide for different wind	
	strengths (high-performance boats) **T** Cleats function correctly	
	STORAGE	
	U Safe, secure and easily accessible	
	V Launching trolleys serviceable	

Ref	Item	Check
	FOILING	
	FP1: Rudder and rudder foil functioning and in good working	
	condition	
	FP2: Twist grip tiller extension in	
	working order, fittings where the extension attaches to the tiller are tight and in good condition	
	FP3: Main Foil and centerboard in good condition	
	FP4: Main Foil Centreboard wand (if	
	wand is attached to main foil) is	
	functioning and adjusting the push	
	rod correctly	
	FP5: Main Foil Flap and push rod in	
	good condition	
BOAT	**FP6:** The wand is adjusting and	
	functioning correctly and is in good	
	working condition	
	FP7: The wand is de-rigged correctly	
	and stowed suitably when not in use **FP8:** Push rod functioning and in good	
	condition **FP9:** All relevant pins and rope	
	systems in good condition at the	
	centre casing	
	Wings:	
	FP10: Wings are fitted correctly and	
	where possible, adjustments can be made to change the angle of the wings	
	FP11: Wings are equipped with	
	floatation bladders in good working	
	order and condition	

* Buddy system can be used if centre has established that keel/dayboats can be recovered by the crew from a capsize (mast horizontal) or swamping

Notes: First impressions count. The boat should be clean and well maintained. Varnish should not be flaking off, silicone sealants should not be moldy, and corrosion should not be evident. All equipment should be fully operational.

TCD1 The inspector may wish to test the watertight integrity of any dinghy by capsizing the boat for 10 minutes on each side. No more than 4 litres/1 gallon of water should leak into the buoyancy tanks and buoyancy bags must be adequate, remain inflated and securely positioned.

Boat Comparisons

RYA Foiling

Boat	Durability	Performance/ handling	Rig and set up	Launch and recovery
Wazp **Mcdougall**	Aluminum foils are relatively robust. Wand system is not too complicated.	Good for intermediate/ advanced foilers. Specific upwind technique needed due to full, heavy rig. Tricky to sail in displacement mode, with the sailor needing to balance the boat effectively. Need 8-10 knots to foil with good technique 12+ for beginners. Good technique required when foiling above 15 knots, after 20-25 knots the boat is very powered up. There is an option for changing rigs and the smaller rig is more controllable in 18+. There is a recommended weight range which should be followed but switching rigs can help get the boat foiling earlier (with big rig) and keep the boat controlled (small rig).	Simple. Specific knowledge needed for foil and rig set up. Retractable foils, pins on the rudder can be difficult to remove leading to issues with recovery. Good technique by the user is required, constantly using body weight to counter balance the boat, or the Wazp will capsize. Often safer and easier to just capsize and lower/ raise the foils that way.	Capsize not needed in theory due to retractable foils. Training needed for beginners on launching a boat with wings. Onshore conditions or conditions with waves/ chop make launching/ recovery uncomfortable and potentially unsafe.
Mach 2 Moth **Mcdougall Mconaghty**	A complex set which needs additional time to keep the boat maintained. There are now several different Moth designs including the Exocet, voodoo and the early design, the blade rider.	Excellent foiling performance at all levels, foiling moths are unstable in displacement mode, which can hamper learning in the early stages due to the potential of frequent capsize and swimming! Safety should be a consideration due to the shrouds and standing rigging which the sailor could make contact with if the boat nose dives. Foils early in about 6-7 knots.	Can be complicated and it's essential to be rigged correctly, both rig and foils. Many different options for set up.Good knowledge is needed for accurate fault finding, and understanding what issues are preventing the boat from working. There are several options depending on the design with different rigging and different foil sizes.	If the launch/ recovery area is small competent capsize recovery/displacement sailing technique is needed to launch without issues. Onshore conditions or conditions with waves/chop make launching/recovery challenging.
Skeeta	Glass, carbon composite. A relatively new boat to the market, which looks to be durable	An all-rounder for foiling. Due to the wide hull sailors can launch and recover in a very stable displacement mode. Stable platform should enable people to learn from all levels, with the opportunity to stop for a rest due to the boats stability when not foiling. Foils in 7/8 knots and upwards.	Simple, but unique set up. The controls are simple, with a Vang/ Cunningham combination and a control for wand length. With the Vang also acting as a Cunningham, this reduces the need to adjust both controls, enabling the sailor to focus on technique and trim.	Retractable foils and a wide stable displacement platform allow for simple launch and recovery. Accurate fitting of the foils is required to ensure their slide (up and down) without issue.

		The boat gybes and tacks on the foils as well as having a rig which is easily flattened. Lowering the ride height all the way down so the boat is also skimming the surface of the water is an option in very strong winds, allowing sailors to still be on the water learning or returning home safely if the conditions were to change suddenly. There are shrouds, so there is the risk of injury on impact from a crash or sudden stop. The foil design should prevent pitch pole as the foil will not produce negative lift	The hull is a scow and wide, which has enabled a deck track to be fitted as part of the Vang system, enabling load to be spread, whilst still ensuring enough leach tension without the need for a more complex mast.	Launch and recovery is simple in shallow water but you should take wind direction and sea state on the shore into account to ensure you launch safely.
Glide Free Foiling Kit Adjustments: - **RS Aero** - **Laser** - **Melges 14** - **Open Bic**	Durable and robust. Specific adaption and re-enforcement is needed to the transom.	Good entry to intermediate level option with adaption available for boats such as RS Aero, Open Bic and Melges 14, as well as the laser which enables a sailor to experience taking off and first flights. The Laser requires a more specific technique to sustain flight due to the weight of the boat, fullness in the rig and limited righting moment. This adaption provide a good introduction to foiling, who may then choose to progress on to a winged boat due to performance restrictions. Lighter boats such as the RS Aero, foil earlier and on all points of sail earlier, enabling a learner to progress from first to sustained flights happily, in approximately 7/8 knots. Adapted boats provide a wide range of wind capability, as well as allowing sailors to rest or sail 'normally' whilst in displacement mode. Their performance is limited as you cannot make adjustments whilst flying, therefore more generally a consideration and platform to learn the basics of foiling.	Same rig set up as the usual non foiling boats. You may want to reduce the purchase to help enable you to sheet the sail in/out in quickly and to the apparent wind changes.	Capsize needed. Retractable foils to enable user to sail in shallow water.

Background Theory

RYA Foiling

Background foiling knowledge

Foiling boats

Hydrofoil vessels have been used on the water for many years. Both motorised and sailing craft have adopted foils to decrease the level of drag in the water and increase the boat speed and efficiency. There are several types of foil used in sailing, and historically dinghies have used a design of foil called 'T-foils' (see below).

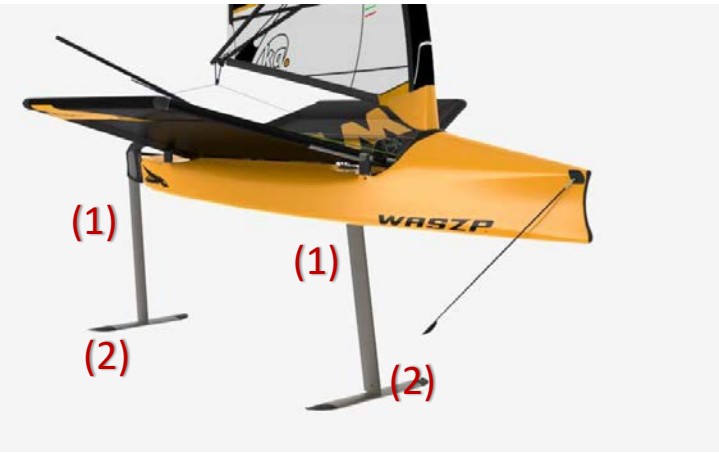
There are a variety of boats including single handers, double handers and multihulls, some are adaptions through the addition of foiling kit, whilst others are dedicated designs.

What is a foil and how does it work

A foil is generally made up of a vertical section and horizontal wing attached at the bottom, which replaces the traditional rudder and dagger board.
As the boat speed increases, pressure builds on the foils, a lifting force is created, similar to an aeroplane wing. This lift brings the boat out of the water, reducing drag and radically increasing the speed of the boat.

Foil adjustment

Both the horizontal and vertical foils can be adjusted, each affecting the performance and lift of the boat.



Vertical foil adjustment (1)
By adjusting the amount of lift generated, a balance can be found between the two foils depending on the speed and angle the sailor is looking for.

- Angling the vertical foils toward the front of the boat will increases lift
- Angling the vertical foils towards the back of the boat will decrease lift

Horizontal foil adjustment (2)
The horizontal foils can be adjusted by up to 5 degrees before leaving the shore. This adjustment affects the lift and trim of the boat, and is also a contributing factor to the 'Angle of attack'

- The main foil can be adjusted to angle the foil or leading edge, up or down
- The rudder foil angle is often adjusted through a twist grip tiller, and affects the trim of the boat, bow down or bow up

Ride height
This is the amount of height created through the foil controls, managing the distance the hull flies above the water.

The ride height can be set before leaving the shore through adjustment of the main foil lift, controling the amount of lift created, however on some boats fine adjustments to the foils can be made on the water, onboard through control lines for the main foil, or through twisting the tiller for the rudder foil.

Without any ride height control, the boat would simply continue to lift out of the water as speed increases, eventually crashing.

Some foils are designed to control height passively with no moving parts, whilst on a dinghy the most effective way is with a wand. The wand provides active control of the horizontal foil by moving fore and aft depending on how high the boat is flying above the surface of the water. The wand controls main foil trim, automatically adjusting the lift, to provide accurate ride height control.

<u>The control systems</u>

Foils

Main Foil **(1):**

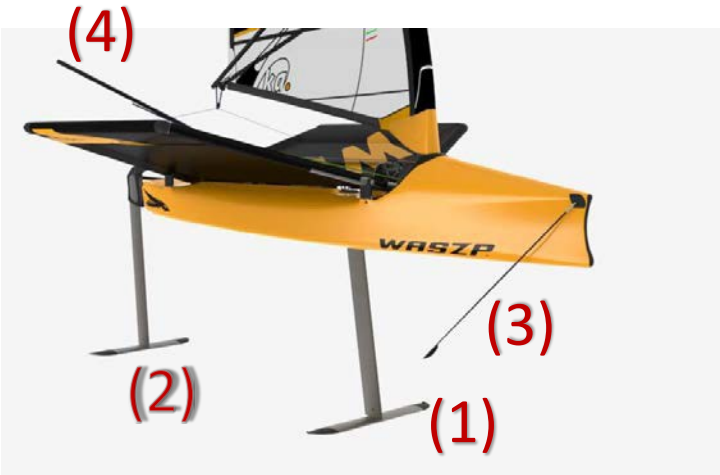
- The main foil lifts the boat out of the water

Rudder Foil **(2):**

- Controls boat trim and bow height by altering stern lift. This can be controlled on many foiling boats whilst foiling with a twist grip tiller.

Wand (3):

- Fitted to the bow or main foil, the wand controls the lift of the main foil, making ongoing adjustments whilst sailing to alter a boat's ride height.
- By adjusting the connection from the wand to the main foil, sailors can control the overall ride height by controlling how much lift is created over the foil.



Tiller (4):

- When a twist grip tiller is an option, sailors can control the boat trim and bow height whilst sailing by increasing or decreasing the lift on the rudder horizontal foil.

<u>Leaving and returning to shore</u>

Some boats have foils which can be retracted, making launching and recovery of the boats relatively easy, whereas others have foils which require fitting from underneath the boat, requiring you to capsize the boat ashore.

Leaving the shore:

As with all boats, it is good practice to carry out 'pre-launch checks' prior to launching, ensuring:

- Foils working and correctly fitted
- The wand, or trim system is working and correctly fitted
- Foil attachments are in working order and correctly fitted
- The launch area (ashore and afloat) are checked and free from obstacles

For boats with foils inserted from underneath, once you are on the water's edge with the mast across the wind, you can approach the boat from the stern and walk to the foot of the mast and lift the boat into the water at its balance point. Once you have walked deep enough into the water you can right the boat through the dry capsize method (avoiding weight on the foils) before sailing away.

Returning to shore:
If possible, stop the boat near to a close reach, assisting the depowering of the rig and ease of landing. Return to displacement sailing mode with continuous awareness of water depth, stopping before running aground.

Apparent wind
Apparent wind is the combination of the 'true wind', and the 'induced wind'.

As a boat's speed increases and it starts to foil, it can go much faster than the true wind speed, this requires the sailor to trim the sails to the apparent wind. For example, if a boat sails on an angle downwind, due to its speed, its sail setting would actually be sheeted in, set to the apparent wind.

Due to the reduction in drag and the dramatically increased speeds of foiling boats, the need to adjust the sails and boat angle to the apparent wind is more critical than in slower craft.

Flight: Take off
Once the foils are set up to ensure the boat will fly, the following practical techniques are needed to take off:

- **Balance** (boat) – Place your weight just behind the mainsheet with the boat heeled to windward
- **Sail setting** – Trim the sail to balance the boat with heel to windward.
- **Course** – Generally, you will need to head on a reach (or close reach) to generate sufficient speed and pressure for take-off. Choosing which reach will depend on how much speed is required by the individual design.

Flight: Sustaining foiling

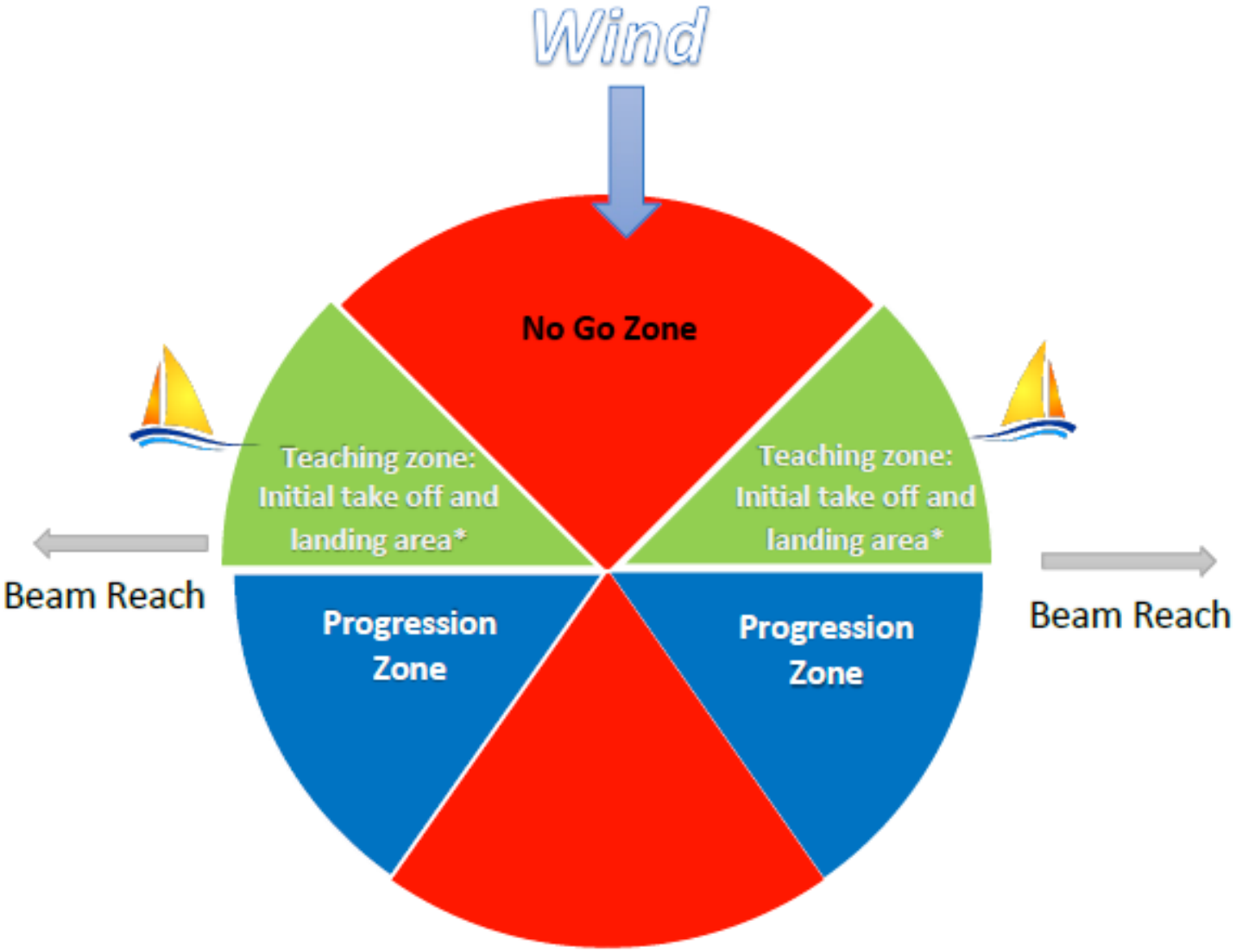
With correct main foil set up, including wand and ride height, rudder foil setup, bow height and boat trim, the following practical techniques are needed for sustained flight:

- **Balance** (boat) - For best performance the boat should be heeled slightly to windward.
    - When ready to sail, choose a goal point, and adopt a dynamic sailing position, ready to move when the boat begins to gain momentum.
- **Sail setting** – Once you have taken off, trim the sail for boat balance, and sheet in, trimming to the apparent wind angle.
    - Continuous trimming to maintain windward heel is needed to keep the boat balanced and on the foils.
- **Course** – Steer the boat to the desired course, re-trimming as required to maintain windward heel, keeping the boat under the rig preventing heeling to leeward and capsizing.

Capsize recovery

To recover from a capsize, the standard dry capsize method may be used. Be careful not to stand on the foils and check that they are in full working order before righting the boat.

Flying Zones



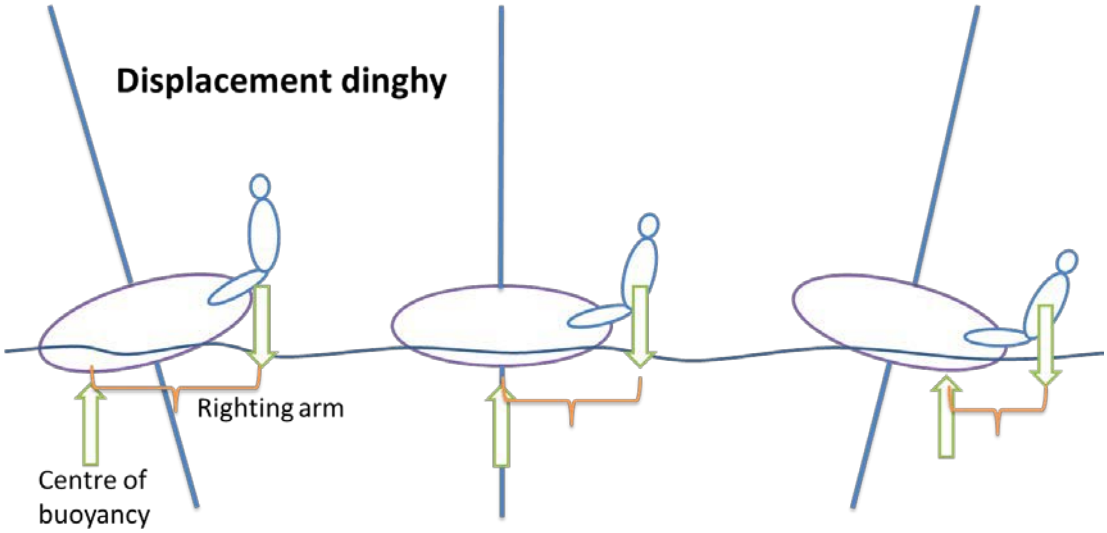
*Winged and adapted boats behave differently on take-off, with some adapted boats requiring a broader take off to encourage the boat to foil

Righting Moment

Understanding righting moment will make a huge difference to a sailor's ability to achieve the best performance from a foiling boat. Once a boat is up and foiling, balance is key. The boat will experience pressure from the rig heeling the boat to leeward, if not corrected the leeward heel will force the boat back down into the water.

By increasing righting moment, sailors can control the boat by preventing leeward heel, use the weight of the rig and boat to their advantage and use the foil under the water to provide resistance – which really helps with upwind performance. You can increase the righting moment either by a) leaning out further (hiking), b) increasing the weight of the helm or c) increasing the distance between the sailor and the centre of lift of the foil by heeling the boat further to windward.

Before discussing this concept within a foiling boat it is important to understand righting moment on a displacement dinghy. When sailing in displacement mode the righting arm is between the sailor's weight and the centre of buoyancy.
See diagram below.



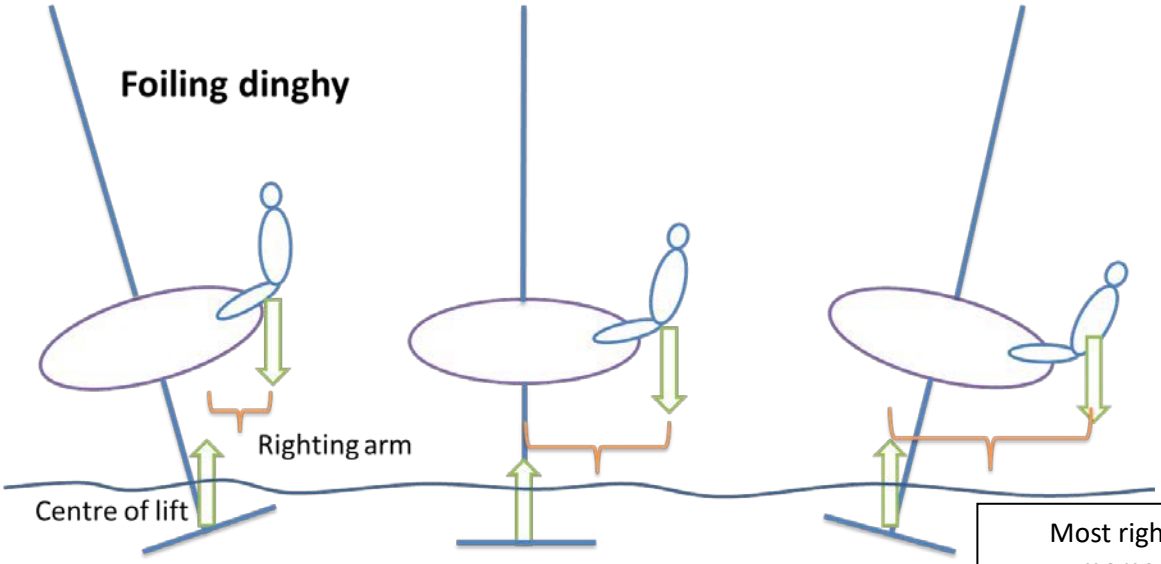
In a conventional dinghy the righting arm:

- **increases** as the boat heels to leeward
- **decreases** as it heels to windward

This is because the centre of buoyancy of the hull moves as the boat heels.
This provides a natural restoring force, stabilising the boat as it heels in either direction

Relating this to foiling craft:
Once the boat lifts out of the water and is foiling. The centre of buoyancy is replaced with the centre of lift as the new pivot point.

As the boat is no longer in the water, the pivot point does not move as the boat heels, remaining as the center of lift of the foils. This means the more you heel the boat to windward, the more righting moment you have.



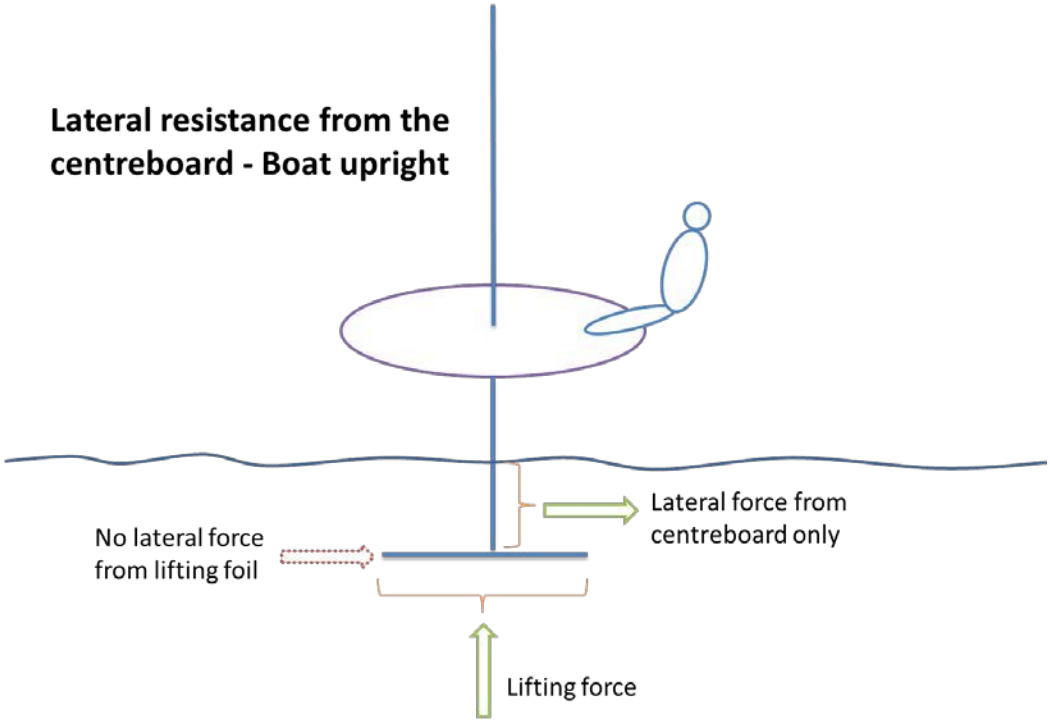
In a foiling dinghy the righting arm:

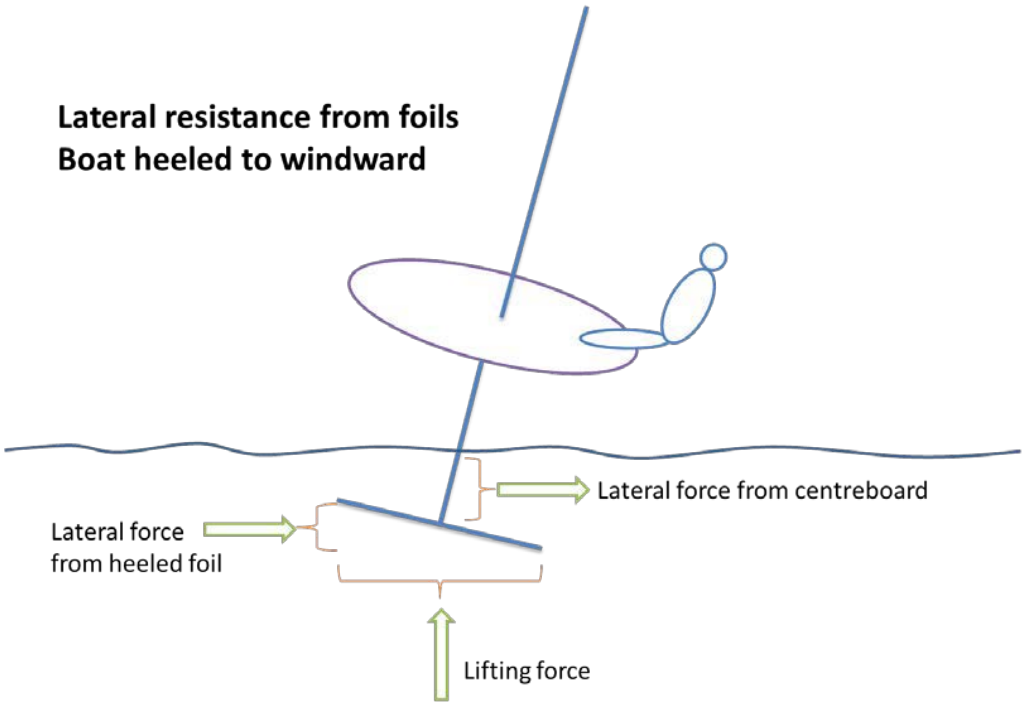
- **Decreases** as the boat heels to leeward
- **Increases** as it heels to windward.

This is the opposite of a displacement dinghy and explains why the boat feels so different to sail on foils.

The centre of lift moves with the centreboard and the boat becomes unstable as it heels in either direction. You need to actively balance the forces to remain upright.

When Foiling: '*Windward heel means more lateral resistance*'..
An added benefit of windward heel includes using part of the lift from your foils to provide sideways resistance under the boat. This allows sailors to ***use the foils*** to help them make progress upwind. See the diagram below to see the difference in lateral resistance under the boat.

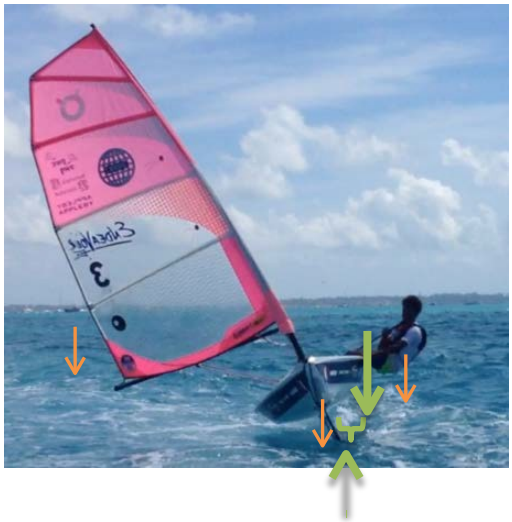

Lateral resistance from the centreboard - Boat upright
Lateral force from centreboard only
No lateral force from lifting foil
Lifting force


Lateral resistance from foils Boat heeled to windward
Lateral force from centreboard
Lateral force from heeled foil
Lifting force

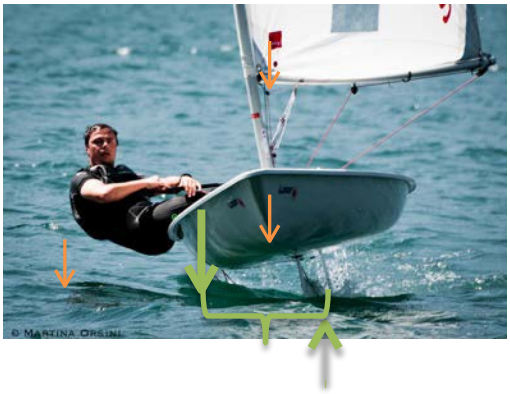
Boat Balance: Leeward heel issues

Heeling a foiling boat to windward improves performance substantially. By not correcting leeward heel through correct trimming of the sail, and if necessary bearing away (steering the boat under the rig) the boat will drive itself into the water. See below the difference in righting moment on the different images of boats foiling.

In this example, the sail is incorrectly trimmed and therefore over-powered, this creates a driving force down towards the water. The righting moment is therefore reduced and the forces are very inefficient, leading the sailor to lose control and the boat to come off the foils and back towards the water.



<u>Techniques for correcting leeward heel</u>



By increasing the distance between the lift force on the foils and the weight of the sailor, hull and rig, you increase the righting moment. This increase will also ensure the lift force from the sail is driving up and away from the water.

Here you can see how winged boats further increase righting moment due to the distance between

a) lift force on the foil and,

b) the weight of the sailor, hull and rig.

Steering and **trimming your mainsheet** are the two options to try and prevent the boat from heeling to leeward.

1) ***Playing the mainsheet***
   Once the boat is foiling and is at least upright, you may decide to ease a little mainsheet to relieve some pressure from your rig and encourage the boat to heel further to windward.

2) ***<u>Steering the rig under the boat</u>***
   In the early stages of foiling it's key that sailors get a feeling for 'steering the rig under the boat', initially aiming at a goal point and trimming accordingly. Then, as you progress, bearing away to flatten the boat and increase windward heel. From there you can re- trim your sheet and sail the course you'd like to.

This boat is on the verge of heeling to windward and needs to change something to ensure windward heel

- As the boat is powered up and foiling, a quick mainsheet ease would enable the boat to heel to windward.

Active mainsheet trimming is key from there to maintain windward heel for the course being sailed.

Windward Splashes!

Upwind Foiling

There are two options to prevent the boat falling over to windward.

1. Sheet in
2. Bear away slightly

This example shows how sheeting in would be the answer.

Sheeting the main will control the balance of the boat, enable the sailor to maintain windward heel and trim according to apparent wind.

Continuous and active mainsheet trim based on the boat's balance is needed to keep the boat flying and heeling to windward.

Here, the boat fell over to windward as there was not enough power in the sail to keep the boat upright.

Whilst foiling upwind, with the sail trimmed, if you feel like the boat is going to fall to windward you may be sailing too close to the wind. In this scenario, bearing away will increase power and stabilise the boat

Bearing away will increase the power in the rig, counter balancing the weight of the sailor and maintain correct boat balance.

Downwind Foiling

There are three options to preventing windward crashes:

1. Sheet in
2. Head up slightly
3. Bring weight inboard

For this specific sailor, heading up slightly and keeping the sail sheeted correctly would prevent the boat falling to windward.

Lastly, and if it is the sailor's intention to go downwind, then by bringing their weight in board, and ensuring the sail is trimmed to the correct apparent wind, this may enable them to continue foiling at the required angle.
Care is required to not to sail **too** low.

If no adjustments are made, the sailor will splash to windward.

1) Sailing too low
Sailing too far downwind affects the airflow and can lead to depowering of the rig.

2) Apparent wind
Even when sailing downwind to the true wind angle, your apparent wind can be much further forwards, meaning you still need to have the sail trimmed relatively close hauled. Playing your sheet and adjusting the sail trim must be happening all the time.

Teaching and Coaching

RYA Foiling

MASTER - Foiling Key Coaching and Teaching points

- What can we assume: Knowledge - theory and practical knowledge to RYA Level 2
- What information and key coaching points do we want to ensure our instructor provides our students with at each element of tuition
- What resources do we need to back up any areas listed below? Diagrams, illustrations, theory work…. Etc
- Key:
  - **GREEN:** Points Specific to Winged Boats: e.g.: Waszp / Moth
  - **ORANGE:** Points Specific to Boats with Adapted Foiling Kits e.g. Laser / RS Aero

Boat Orientation:

- Instructor led
- Basic information
- Involve the students
- Initial setup required

	Teaching Points (Points which students receive when being instructed)	Key Instructor knowledge and considerations (These points may not be delivered to student)	Resources required
BOAT ORIENTATION	Sails/sail controls - Need to be trimmed to apparent wind - Playing the sheet helps ensure correct balance - More vang = flatter sail - More Cunningham = Twisted sail	• Choice of rig size • Sail controls adjustment to create most manageable power, encourage take off, flight etc • How to fine tune (Int/Adv level or Instructor knowledge) • Potential on water adjustments • Adaptions which are made for displacement boats	Use of a sail
	Foils/foil controls - Main foil lifts the boat out of the water - Adjust the main foil for more or less lift - Main foil affects ride height - Rudder foil lifts the stern - Rudder foil affects boat trim	• Correct insertion and connection / adjustment of foils / wands etc. • Possibility of having foils in whilst using launching trolley / dollies • Check foils for damage and smooth operation of foil • Importance of getting the correct trim of both the main foil and rudder foil • Link between foil setup – main foil & ride height – rudder foil & boat trim • Set all settings at mid-range to ensure a safe platform to begin foiling	Illustrations of different foils Trolley / Dolley set up for boat with foils in Use of foils Videos of boats foiling Hand out linking foil set up with boat trim
	Hull/Wings - Provide righting moment - Bladders help keep wings afloat and slow capsize down to prevent total inversion - The more horizontal the wing the more righting moment you get	• Different set up on the wings Beginner mode etc. • All relevant retaining pins are tied on and ready to attach to main foil • Link with Balance on winged boats • Bladders and why they are there • Advice for sailing winged boats in displacement mode	Boat with wings

	Pre-flight checks - Check the main foil is in gear block or main foil push rod attached - Check how much lift you have on the rudder - Ensure mainsheet can run freely	• Main foil Set up, with pushrod or gear block • Ensure foil adjusts as required • Rudder foil setup with amount of lift • Check condition of foils – no damage etc. • Sail trim fine-tuned according to what you need for that session	None

Launching (Instructor led):
- Instructor rigs the boat
- Instructor briefing
- Instructor launches the boat initially
- Student is later placed in the boat: clear patch of water, consideration: downwind space

	Teaching Points (Points which students receive when being instructed)	**Key Instructor knowledge and considerations**	**Resources required**
Launching	**FIRST LAUNCH**	• Who launches: Instructor vs Student • Displacement boat with foiling kit is safe and stable, very suitable for student to launch • Winged boat Instructor to launch 1st time • Winged boat launching area to be risk assessed by instructor • Demo by instructor in Laser / RS Aero then the student launches • Instructor to consider suitable launching area, foil draft and weather conditions before decision on whether the student or instructor launches • If in doubt, instructor launches	Additional safety boat driver required for getting student out if instructor launches
	Foil draft - Awareness of water depth in your launch/ recover area	• Fragility of the foils • Where and when to insert or drop and engage foils based on the water depth • Suitability for student to be in the boat	Demo, video or a hand- out
	Engaging foils - Understand specific points for engaging main foil - Understand how to attach rudder and how/ if you can adjust it up and down	• Key considerations or requirements • Alongside rib or pontoon • When to attach pushrod and untie wand • Set main foil and rudder at mid-range	Demo, video or a hand- out

	<u>Underwater obstacles</u> - Briefing of students about location specific hazards	• Knowledge of sailing area especially in and around the launching area • Safety systems to disengage the foils if you hit the bottom	None
		• Depth where launching and decision to swim the boat out	
	<u>Boat balance and slow speed manoeuvrability</u> (boats with wings) - Use your body weight to maintain balance, keeping close to the centreline when underpowered - Ease sail and head up to regain control when overpowered - Ensure you have space to use these techniques when launching	• Demonstrate control at low speeds and make student aware of possible hazards • When to adjust body weight • When to adjust sail trim • When to adjust angle • Why you may stand up • Techniques when stood up • Advice for sailing winged boats in displacement mode	None
	<u>Techniques (weight distribution/balance)</u> - Feet near centreline - Use weight to prevent capsize - Once boat is balanced, keep weight central and focus on sail trim and sailing angle to control the boat	• Body position in the boat • Best sitting/kneeling position for maximum control • Weight management • When to stand up	
	<u>Angles of launch (wind awareness)</u>	• Discuss and demonstrate onshore breeze scenario • Considerations when lifting the boat into the water • How to lay the boat (winged boats) based on the wind direction	

Recovery:

- Sailing back to the shore
- Who will do this (Instructor or student)
- Student sails back coached closely by instructor in safety boat
- Key considerations
- Not grounding foils, how to control boat when it's not powered up
- Safety

	Teaching Points (Points which students receive when being instructed)	**Key Instructor knowledge and considerations**	**Resources required**
Recovery:	Foil draft - Be aware of water depth in your launch/ recover area - Be aware of your angle of approach to launch/ recovery area - Have a plan of where to jump out and swim the boat if that is needed - Plan B in case initial angles don't work	• Knowledge of beach/slipway shelving angle and any change with tide • Differences between boats with retractable foils and fixed • foils Awareness of foil design and fragility of the foils	Additional safety boat driver required for getting student out if instructor recovers
	Disengaging foils - Leave plenty of space between you and the launch/ recovery area when disengaging - Have a plan for whether or not you can raise main foil and rudder or if you need them down based on your angle of approach to the launch/ recovery	• Early preparation for recovery • Consider where student will stop before switching with instructor or before foils become disengaged • Ensure space downwind and consider space to leeward in case of capsizing	
	Underwater obstacles	• Importance of where to recover and potential hazards	
	Boat balance and slow speed manoeuvrability (Boats with wings) - Use of body weight to maintain balance, keeping close to the centreline when underpowered - Ease sail and head up to regain control when overpowered Ensure you have space to use these techniques when recovering	• When to adjust body weight • When to adjust sail trim • When to adjust angle	
	Techniques (weight distribution/balance - Body position in the boat - Use weight to prevent capsize - Feet near centreline - Once boat is balanced, keep weight central and focus on sail trim and sailing angle to control the boat	• Option of intentional capsize for recovery – pros and cons • When it's potentially safer to capsize to recover foils • Best sitting/kneeling position for maximum control • Weight management • When to stand up	Shore crew to assist in recovery
	Angles of recovery (wind awareness)	• How to return in an offshore breeze without grounding foils	

Capsize recovery:

- Righting the boat safely considering the wind, foils and wings

	Teaching Points (Points which students receive when being instructed)	Key Instructor knowledge and considerations	Resources required
Capsize recovery:	Awareness of foils - Safety: Care to be taken in a stationary boat, when climbing over the back of the wing as the T-foil is exposed	• Safety of how to move around foils and place hands / feet • Use of Helmets • Any standing rigging • Which side to recover the boat in relation to the wind direction • Weight on the bow to ensure the boat points into the wind when • second capsize is likely	
	Boarding after capsize - Front/Back - Water-start by sheeting the mainsheet as you climb onto the wing - Ensuring mainsheet is free - Using the power in the rig to counter balance weight as you climb onto the wing		
	Methods and techniques - Right the boat with the sail downwind - Swim the bow into the wind - Take the mainsheet - Sheet the mainsheet - Climb over the wing - Take the tiller extension when possible - Ease sheet and head into the wind to regain control - Ensure bladders are fully pumped to prevent inversion if resting while capsized on a winged boat	• Safety considerations • Awareness of surroundings • How to keep the boat safely capsized and where • Safe area to stop • Use of a RIB/ safety boat to rest the wing or come alongside for a break	

Basic take off:

- Initial instructor briefing, with short sessions, with coaching in-between and course to be followed
- Basics of keeping the boat flat and controlling a constant speed
- How to react as the boat takes off and what to do to control foiling
- How to bring the boat off the foils
- What to do to land the boat safely
- Spatial awareness and sailing area required
- How to Initially lift the boat out of the water; correct course, sail trim with correct balance to generate speed and lift from the foils

Teaching Points (Points which students receive when being instructed)	**Key Instructor knowledge and considerations**	**Resources required**
Wind/Sailing angles - Close, beam or broad reach depending on the boat you are sailing - Don't over sheet the sail - Heel the boat to windward - Maintaining a sailing line - Goal points	• Point of sail • Different angles needed for different foiling boats • Different techniques with the mainsheet for different boats • How to adjust foils to encourage or control take off • How to tune rig for more or less power to help student take off	Points of sailing diagram and explanation
Body position Weight distribution: - Weight back (un-stayed rigs and boats with foiling kits) to increase angle of attack on main foil - Weight middle on winged boats with stays - Weight can stay middle /middle forwards on winged boats without stayed rigs when sufficient wind for take off	• Specific key coach points and considerations for foiling craft • When to use kinetics to help with take-off and for which boats kinetics are a key area When to keep weight slightly in board on • the wing to maintain correct balance for take off	Video or handout for a visual aid
Boat balance - Heel the boat to windward - Do not allow the boat to heel to leeward	• Specific key coach points and considerations for foiling craft • Differences in how far to windward you can heel different foiling boats • What forces there are creating issues when the boat is heeling to leeward	Video or handout for a visual aid
Sail Trim - Do not over sheet - Trim sail to maintain windward heel - Trim in fast once the boat lifts out of the water	• Specific key coach points and considerations for foiling craft • Sail setting and trimming • Apparent wind • Apparent wind changes in gusts/lulls and how to trim to maintain airflow	Video or handout for a visual aid
Boat controls: - Minimal rudder movement		
Rudder and foil - Take extra care when moving foils to and from the boat	• Basic settings for flight • Set up/ considerations for condition • How to trim to encourage take off or to control bow height	Video or handout for a visual aid
Resting - Ensure you have plenty of space downwind	• Wind angle • Controls	Safety boat to rest on

Landing: - How to use sail trim, body weight and sailing angle to SLOWLY land			
	Teaching Points **(Points which students receive when being instructed)**	**Key Instructor Knowledge and Considerations**	**Resources required**
Landing:	Techniques for controlling • Ease sheet slowly • Move weight in slowly • Head up slowly • How to de-power and control speed / landing	• Safe landing • Importance of slowing down in control (slowly) • Sailing area which does not require a fast landing	

Encouraging flight:

- After taking off
- Steering the rig under the boat and trying to keep the boat in the air, with mainsheet trim and a focus on finding the correct balance

Teaching Points **(Points which students receive when being instructed)**	**Key Instructor Knowledge and Considerations**	**Resources required**
Weight distribution and body position - Move your weight back to help take off - Move your weight forwards when flying - Keep weight further forwards	• Where & how to sit/kneel depending on conditions • Link with trim and balance • When to bring weight in or out depending on power in the rig • How to link weight distribution with sheet adjustment and steering to maintain windward heel and sustain flight	
Most efficient point of sail Reaching Easing sheet Weight back Very fast mainsheet pumps Smooth body movements Weight in on the wing Course- keep the rig under the boat	• Generating the most apparent wind vs generating most boat speed • Steering to keep the rig under the boat and avoiding leeward heel • How to set foils to encourage take off - more ride height and less lift on the rudder • Light wind techniques - Sitting in while sailing and bearing away to reach in gusts or areas of more pressure • Strong wind techniques – feathering in the gusts. Keep mainsheet eased to maintain windward heel as you feather	Video or handout for a visual aid
Pumping	• Controlled pumping without adversely affecting balance and trim • Pumping with rig and slight body movement without disturbing flow on the foils	
Spotting of gusts and stronger winds Looking out of the boat and anticipating the gusts and lulls	• Preparation for gust hitting • Easing sheet in gusts to maintain airflow as apparent wind moves aft • Sheet on in lulls as apparent wind moves forwards	

Sustained flight:

- When to use weight, sailing angle or mainsheet tension to sustain flight- key info depending on the situation

	Teaching Points (Points which students receive when being instructed)	Key Instructor knowledge and considerations	Resources required
Sustained Flight	Boat balance and body position - Windward heel is key - Steer and sheet to maintain balance - Weight middle forwards - Hike out for more righting moment - Move weight in when underpowered and boat heeling into windward - No power and falling to windward. Bear away or trim sheet if sailing high. - No power and falling into windward. Head up or trim sheet if too low - Too much leeward heel bear away and keep the rig under the boat. Ease mainsheet as needed to achieve the bear away	• Adjusting to keep the boat flying with emphasis on heeling to windward whilst ensuring good trim is maintained • Steering to keep the rig under the boat and avoid leeward heel • Knowledge of forces on the boat and how leeward heel creates performance issues when trying to sustain flight • Differences with appropriate sailing angles depending on the boat you are sailing • When to prioritise using your weight distribution to sustain flight over your sailing angle and/ or mainsheet trim	Camera for on water coaching Potential use of helmet / headsets Potentially buoys or marks to outline sailing area Video or handout for a visual aid
	Sail trim - Continue to trim to maintain balance - Be aware of over sheeting - Trim sail on to prevent boat falling into windward - Be fast to ease sheet when overpowered to maintain windward heel When underpowered use sheet to maintain balance, but be quick to re-trim once boat is balanced	• Adjusting to sudden change in apparent wind in order to maintain speed and lift from the foils • When to prioritise using the mainsheet over weight distribution and/ or sailing angle	
	Points of sail - Make small steering adjustments to sail the mast under the boat - Minimise steering movements - Foiling on a close reach to upwind course will be easier on a winged boat or lighter boat with foiling kit - Foiling on a beam reach to broad reach will be easier on a heavier boat with foiling kit - Bear away to prevent leeward heel - Head up for power when underpowered foiling downwind - Bear away for power when foiling upwind and underpowered	• Importance of goal points • Change of goal points as time of sustained flight is increasing • When to prioritise using your sailing angle to sustain flight over your weight distribution and/ or mainsheet trim	Points of sail diagram

	<u>Apparent wind angles</u> - Trim your sail on when boat begins to fly and apparent wind moves forward - Be prepared to ease sheet when foiling into gusts to adjust trim to the apparent wind moving aft - Be prepared to sheet in during lulls, when the apparent wind moves forward	• Adjusting course steered as apparent wind changes • How the apparent wind angles change in gusts and lulls and the importance of mainsheet trim to maintain balance and airflow	Whiteboard for apparent wind theory
	<u>Spatial awareness</u>	• Constant awareness in preparation for foiling and change of scenario once foiling • Space across, up and downwind depending on the boat you are sailing and the angle you are likely to be foiling at	
	<u>Rudder angles (basic)</u> - Trim rudder to control the pitch - Bow level or slightly down	• Degree of movement • Set the boat up to fly level	

Upwind:

- Using boat balance and sail trim to ensure you can find the correct sailing angle to sail upwind. Understanding all the benefits of windward heel.

<u>Teaching Points</u> <u>(Points which students receive when being instructed)</u>	**<u>Key Instructor knowledge and considerations</u>**	**<u>Resources required</u>**
- Look upwind - Trim mainsheet to ensure you have windward heel - With windward heel, steer up to a close hauled course - Maintain equilibrium between weight and mainsheet to keep the boat heeled to windward - Bear away for more power - Head up to de-power Keep boat trimmed level through rudder foil trim	• Windward heel, power generation, sail trim adjustments, change of goal points once foiling • How much windward heel depending on boat the sailor is using • Forces on the boat and how windward heel improves upwind performance • Differences in rudder trim from downwind course • Mainsheet trimming • Small steering movements • Steering with mainsheet	Camera for on water coaching Potential use of headsets Buoys or marks to outline sailing area

Downwind:

- Using apparent wind to bring you safely downwind understanding how to depower and where to sail to maintain flight when underpowered

Teaching Points (Points which students receive when being instructed)	Key Instructor knowledge and considerations	Resources required
- When sailing downwind keep sheeted in to trim to apparent wind - Weight in slightly - Bear away to de-power - Head up for power - Don't sail too low - Trim bow down slightly - Weight back slightly (in windy conditions)	• Reacting and adjusting to increase and decrease in wind strength / angle, ensuring boat trim is maintained in relation to boat speed • Foil trim for downwind • Optimum sailing angles • Risk of pitchpole	Camera for on water coaching Potential use of headsets Buoys or marks to outline sailing area Video or handout for a visual aid

Foiling Gybes:

- *Slight leeward heel on entry and windward heel on exit.
- *Carve through the turn.
- *Keep sheeted in and transfer weight out on the new wing while steering to keep the boat balanced

Teaching Points (Points which students receive when being instructed)	Key Instructor Knowledge and Considerations	Resources required
- See above*	• Non foiling • Body position • Weight distribution	
Speed - Maintain speed before gybe - Ok to glide downwind while steering the boat to ensure balance - Don't start the gybe on a downwind course as you will run out of power	• Importance of angles • Issues with sailing too high before the gybe • Issues with sailing too low while gybing	Camera for on water coaching Potential use of headsets

<u>Boat balance</u> - Slight leeward heel on entry - Slight windward heel on exit - Carve through the turn and maintain balance with steering - Bring weight under boom before the sail swaps sides - Pop battens after your weight is on the new wing - Swap hands	• Carving and trying to maintain the same balance on the foil throughout • Link between weight distribution and steering to maintain balance • Different angles needed in different conditions to maintain balance on exit	Potentially buoys or marks to outline sailing area Video or handout for a visual aid
<u>Sailing angles</u> - Broad reach to broad reach	• When to stay low on exit and when to sail high • When to continue downwind to maintain balance • Issues with moving weight too soon or too late	

Advanced Tacking:

- (Entry to and training for foiling tacks)
- Using slight windward heel, fast movement for the weight transfer and constant mainsheet trim to allow a low exit you can stay on the foils throughout the tack

	Teaching Points (Points which students receive when being instructed)	**Key Instructor knowledge and considerations**	**Resources required**
Advanced Tacking:	Boat balance - Slight windward heel - Wing to wing with body weight - Ease mainsheet on exit	• Non foiling • Body position • Weight distribution • Fast body weight movement is key • Takes time, many pros cannot foil tack • Harder than gybing	Camera for on water coaching Potential use of headsets Potentially buoys or marks to outline sailing area
	Speed - Maintain boat speed on entry	• Importance of angles on entry and exit to ensure enough speed to stay on the foils throughout tack	
	Sailing angles - Maintain boat speed on entry - Exit low just below close hauled	• Importance of speed on entry • The link with mainsheet trim and balance to ensure a low exit	

Further areas

Fault analysis: Student set task to find correct set up to achieve what's needed e.g. take off, sustained flight or altering ride height or boat trim through foil angles		
- Bow down? Too much rudder lift - Boat leaping out of the water, not enough rudder lift or main foil engaged too far (riding too high) - Choppy or wavy? Lower ride height	• Knowledge needed for correct set up for the wind conditions and sea state based on the session plan	Stripped down boat: *how to put it together *bad foil set up and manage -
Coaching from a RIB		
	• Drive behind to windward • Keep safe distance • If driving to leeward to check boat trim, foils etc. leave enough space in case the boat capsizes to leeward • Reduce speed if sudden stop is anticipated • Form of communication between sailor and instructor to be confirmed in briefing	
Safety boat recovery		
	• Consider design of boat and whether righting moment issues from wings are going to require specific style of rescue • Consider disengaging foils and towing astern on boats with retro fit kits • Slow approaches prioritising sailor • Use RIB tubes to rest the wing on with the boat pointing head to wind • Consider capsizing the boat into the rib if the wind direction is not suitable for an alongside tow	

Foiling Essentials

Skill	Teaching Points (Students' learning)	Coaching Points (Instructor knowledge)	Resources
Sail trim	- Generating speed - Power vs drag - Apparent wind	- Overall sail trim needed for different tasks e.g. take off, sustained flight, performance etc. - Changes needed for gusts and lulls	- Whiteboard - Videos - Handouts
Boat balance	- Windward heel: 5 degrees or more for righting moment - Leeward heel issues	- Differences for righting moment on different boats and different techniques required - Using the weight of rig and boat as righting moment - What forces are on the boat which help performance - Which forces create issues when heeling to leeward	
Boat trim and bow height	- Rudder foil adjustments - More lift on the rudder to trim the bow down - Body weight can be used to help increase lift on the foils	- Different sailing angles will need more or less lift on the rudder to keep the boat level/ bow down - Body weight distribution and on which boats this is a key factor	
Wind awareness and course	- Sailing on appropriate reach for the take off - Heading up or bearing away to sustain flight depending on situation - Keeping sail trimmed to apparent wind	- Which specific course is appropriate to sail on for take off, depending on the boat being used for foil training - How to achieve specific course to sustain flight depending on which foiling boat is being used for training	
Ride Height	- Main foil angle - Set up in gear bock - Ride height adjustment - Gearing and how it adjusts the range of movement on the wand	- Overall knowledge of suitable ride height and gearing settings for the conditions - How to make on water adjustments to maintain performance in changing wind/ sea state	

Candidate presentations

TOPIC	TEACHING POINTS
Foiling safety	Discuss the option of helmets and/or impact clothing. Importance of ensuring when foiling we take responsibility for keeping a good lookout and taking avoiding action from any potential collision. Awareness of water depth and use local knowledge when choosing sailing areas Capsizing and the small chance of the sailor falling onto the foils Discuss the silence when foiling, and ensuring distance from other water users, who may not hear foiling boats coming
How a foil works (inc. Wand)	Flow over the foil and how lift is created Shape, trim settings, ride height, drag Function of the wand
Points of sail (foiling)	Different points of sail to achieve take off on different foiling boats Different points of sail to sustain flight on different foiling boats Angles in and out of manoeuvres Techniques required to achieve course and angle desired
Apparent Wind	Explain the difference between True Wind, Induced Wind & Apparent Wind Discuss how and when apparent wind comes into effect with foiling Explain what to do when the apparent wind starts affecting your sail trim Introduce concept that as boat speed increases, the faster you go, the more effect that the apparent wind has on you foiling
Techniques for sustaining flight	Explain the transition phase between take-off and maintaining sustained flight Use of sailors weight to ensure boat trim is most beneficial for foiling Adjustment of sail trim to gain control over the boat balance - using main sheet Ensuring windward heel is maintained to sustain flight Steering the boat to manage gusts and lulls in addition to mainsheet trim
Righting moment	What is righting moment How does righting moment affect different foiling boats How to increase righting moment
Ride Height & Bow Height	How to adjust ride height on specific boats and when Higher ride height makes take off easier however the boat can feel more unbalanced Lower ride height increases boat stability, but less opportunity to heel to windward Bow height is adjusted by increasing or decreasing rudder lift through use of twist grip tiller or trim wheel (on Glide Free adapted kits), or by moving your weight fore and aft Bow height should be set to keep boat foiling level or slightly bow down
Rig Set up	Depth controls Rig tuning for efficiency when sailing Adaptions on rigs for adapted foiling boats Standing rigging and set up on advanced foiling boats (Moths) Different rig set ups on different boats, pros/cons for training environment Vs performance
Upwind / Downwind Foiling Techniques	Ensure that the sailor is at the right ability level before introducing upwind foiling Make sure that the student is comfortably foiling and sustaining flight Importance of windward heel being fully understood to start steering upwind Discuss the ability to feather the rig when steering upwind Explain importance of looking upwind to pre-empt any gusts or lulls and react to them, foiling upwind very rarely is a straight course. To foil downwind, again make sure the student is under control sustaining flight before turning off the wind
Different foiling boats and products	Types, level, advantages/disadvantages and benefits Suitability in training environment Launch and recovery options Performance Safety