

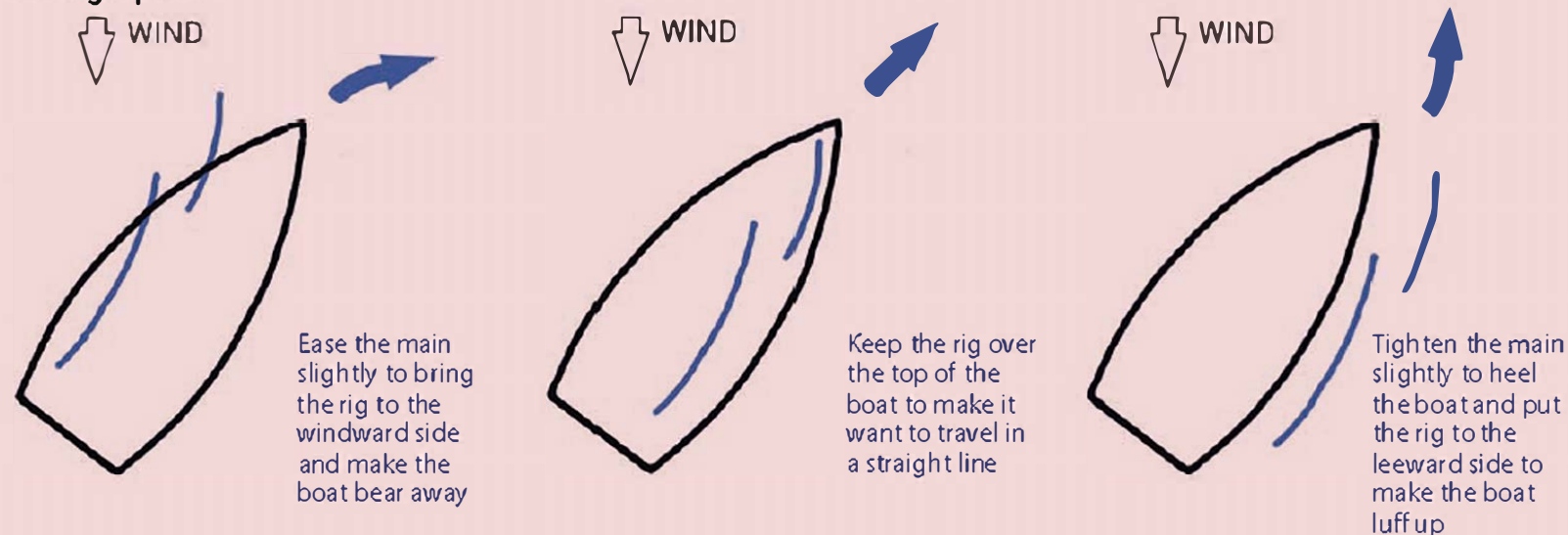
The art of rudderless sailing

Rudderless sailing is an interesting skill to teach. It's easy to end up with students doing pirouettes with very little time to fathom out what is going wrong before the boom is heading in their direction again. However for some people, 'taming' and understanding how to control the dinghy can revolutionise their sailing.

To really understand what we are teaching we need to delve slightly into the realms of physics. But be careful not to over-simplify as you can miss important parts which may hinder understanding.

Nic Wymer, RYA Coach/Assessor explains.

Sailing upwind



How a boat turns

First we need to consider the forces involved:

- » The fore and aft balance of the sail area: How much sail is there in front of the centre of lateral resistance and how much behind?
- » The shape of the hull: Is the boat upright or leaning over?
- » The centre of effort: Is the rig

over the top of the hull or off to one side due to heeling?

Sailing upwind

When sailing upwind, we have the largest proportion of force trying to push us sideways. This can be used to help fine tune the boat to travel in a straight line, using the techniques 'jib in and main out' to bear away, 'main in and jib out' to luff up. Although

this helps with fine tuning, it is too slow on its own to steer the boat.

The more responsive way to steer the boat is using the balance or heel of the boat. When the boat is leaning over a combination of factors come into play:

Hull shape

Because the underwater shape of the boat is not symmetrical when

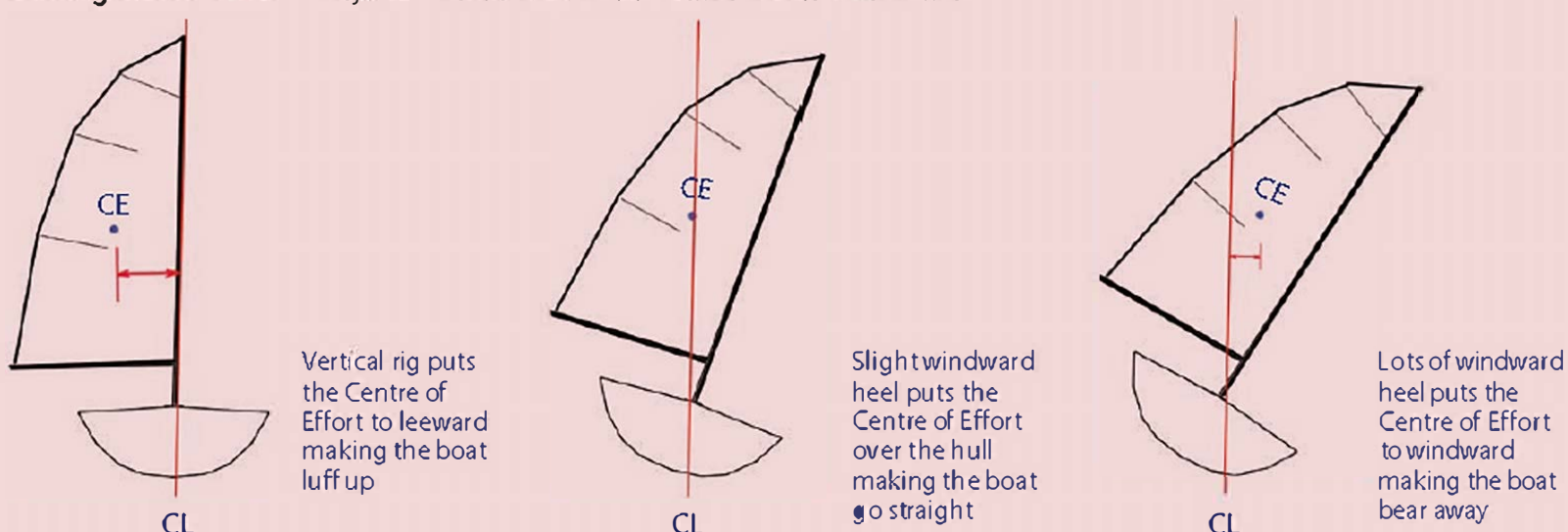
it's heeling it will not want to travel in a straight line. The direction it will travel depends on the hull design, but in itself is quite often not the cause of the boat wanting to turn.

The sails

The sails are the larger force at work here, and the fact they are no longer over the centre of the boat

Sailing downwind

Key: CE = Centre of Effort CL = Centre of Lateral Resistance





Make sure the blade is clear of the water and lift the centreboard a little

means the force pushes the boat to one side, in much the same way as if you paddle on only one side of a dinghy it will go around in circles.

The underwater shape can work with or against the force of the sails, which is why some boats are very predictable and relatively easy to sail in this way – the Wayfarer being a particularly good example. Some boats are far trickier, due to the underwater shape changing with heel – a GP14 being typical of this. Before GP14 fans complain, there are some very good rudderless GP14 sailors, but it takes practice!

When sailing upwind, if the rig is pulled over to the windward side it will steer the boat away from the wind as long as it is still powered up.

Sheeting the mainsail in to create leeward heel will cause the boat to turn upwind. Using the mainsail to keep the boat flat or maybe even with a little

windward heel will make it go in a straight line.

Sailing downwind

Sailing downwind involves using the balance of the boat with roughly equal amounts of sail needed on each side of the boat's centreline. The head of the main will be the part of the sail that moves the furthest with a little heel. Sometimes, using the spinnaker can keep all these forces nicely balanced and also help drag the bow downwind.

To tether or not to tether?

There are generally two techniques for teaching people to sail without using the rudder:

1. Take the rudder off the boat, or lift the blade so it does not touch the water.
2. Leave the rudder down but keep the tiller centralised using elasticated cord or bungee.

Taking the rudder off will result in most dinghies having little directional stability, so a lot of effort is needed to keep the boat sailing in a straight line.

Tethering acts a little like a fin on a windsurfer and helps keep the boat going straight. Just as a windsurfer has to move the rig around to turn, the tethered rudder dinghy needs to be heeled and trimmed to change course, tack or gybe.

Initially it may be easier for our students to achieve a successful outcome with a tethered rudder. If they struggle to turn, the elastic just needs loosening or moving towards the back of the tiller so it has less leverage. If they are turning too much then the elastic can be tightened or moved forward.

Set up for success

- » Have a go yourself. If you are struggling due to the wind or water, don't try and teach it at this time.
- » Use a boat that responds well to rudderless sailing.
- » Allow lots of room and avoid having multiple boats in the same area. A collision will really damage a student's confidence!
- » Reinforce the fact that the only change to the boat is the rudder and that, with a little confidence,

they should be able to sit out to keep the boat upright. Nervously keeping all the body weight in the middle of the boat will make things harder.

- » Do a demonstration.
- » Some dinghies are very twitchy with small corrections causing quite rapid changes. This can be reduced by reefing the sail if there is enough wind.
- » Lay a triangular or windward leeward course to give the students something to focus on outside the boat and make them aware of their surroundings.
- » Encourage them to sit fairly still in the boat when going upwind, and move their weight out smoothly so the mainsail can be brought in without the boat heeling too much.
- » Downwind, lift the centreboard up a little further. The helm may need to stand so they can move their weight from one leg to the other and use their balance to steer.
- » To gybe, steer by heeling to windward gently and pull the sail over early. A quick adjustment of balance will keep the boat going in a straight line but this may take a bit of practice. Backing the jib at the right time can help stop the boat over turning.
- » When tacking, backing the jib at the right time can help the boat go through the wind.
- » Consider taking the mainsheet direct from boom if it makes the sheeting a bit smoother.
- » If students are getting frustrated and finding it difficult, get in the boat and demonstrate it with them on board, or move on to something else.

Once a student can successfully sail rudderless the sense of achievement is huge and can really help with their normal sailing. They will understand both how to set the sails and balance the boat in sympathy with what they want the boat to do, and just use the rudder for fine tuning.



If the boat is hard to turn move the bungee backwards or ease the tension



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