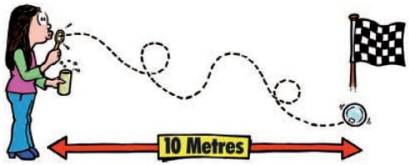



Wind speed and direction using soap bubbles

Context	Wind is one of the most important weather elements. Measuring how strong it is and which direction it is blowing from in our local area can be related to the bigger weather picture as shown online or on TV.		
Length of time	1 hour	Suitable locations	An open area such as a playing field or park, away from any traffic hazard.
Equipment needed	<ul style="list-style-type: none"> • A simple bubble blowing kit • Something to measure time interval, e.g. watch, stopwatch or clock app on a smartphone • A compass showing direction 		
Suggested delivery		Objectives (2 -3) Key Skills	
<p>Measure wind speed by timing how fast a bubble moves</p>  <p>Two people are needed for this: a 'blower' to blow bubbles and a 'timer' to time them using a stopwatch or watch or phone. Blow a few test bubbles to judge roughly which way the wind is blowing, and choose a starting location at the upwind side of the field. Place a marker (e.g. a clipboard or pullover) at your start location and second marker 10 metres away in the general direction the wind will carry the bubbles. The second marker is your finishing line. If the wind is very light you can use a shorter distance.</p> <ul style="list-style-type: none"> • The blower blows a burst of bubbles and the timer starts the watch/phone • The blower chooses a bubble and follows it. When the bubble crosses the 10m line he shouts to the timer to press stop and the timer shouts out the time the bubble took. • Calculate the wind speed by dividing 10 metres by the time the bubble took to cover that distance. So if the time the bubble takes is 5 seconds, then the windspeed is $10 \div 5 = 2$ metres per second. • Repeat a few times and find the average time. <p>Measure wind direction by following bubbles</p>  <ul style="list-style-type: none"> • Place a marker at your start location. • Blow some bubbles then pick one to follow. • Chase your chosen bubble, without getting in its way, until it pops or you lose it, then stop. • From the place you have stopped, blow another bubble and follow that one, and so on. • When you run out of space, stop and look back to the marker where you started. • Now use your compass to work out the direction from where you finished back to the starting point. • This will give you the wind direction, because wind direction refers to the direction the wind <i>is blowing from</i>. • Repeat a few times if possible. 		<p>Objectives</p> <ol style="list-style-type: none"> 1. To measure wind speed and wind direction using a simple technique. 2. To compare measurements with those from routine observations shown online. <p>Key Skills</p> <ul style="list-style-type: none"> • Observing techniques • Recording measurements • Simple calculations 	
Potential risks to consider	Make sure that pupils cannot run into a road or other hazard such as a ditch or obstruction whilst chasing bubbles.		
Possible follow-up activities	Relate the wind speed and direction that you have measured to that shown on a website. The direction should be similar, but the wind speed will be lower because you have measured it close to the ground, rather than at a standard height of 10 metres.		
Useful links	www.windy.com shows how winds are flowing over Europe, UK and N Atlantic. Enter your location in the top LH box and the wind speed and direction where you are will be shown. Wind speed is shown in knots, as used by pilots and sailors, so just halve the number to get metres per second. 20kts = 10 metres per second.		