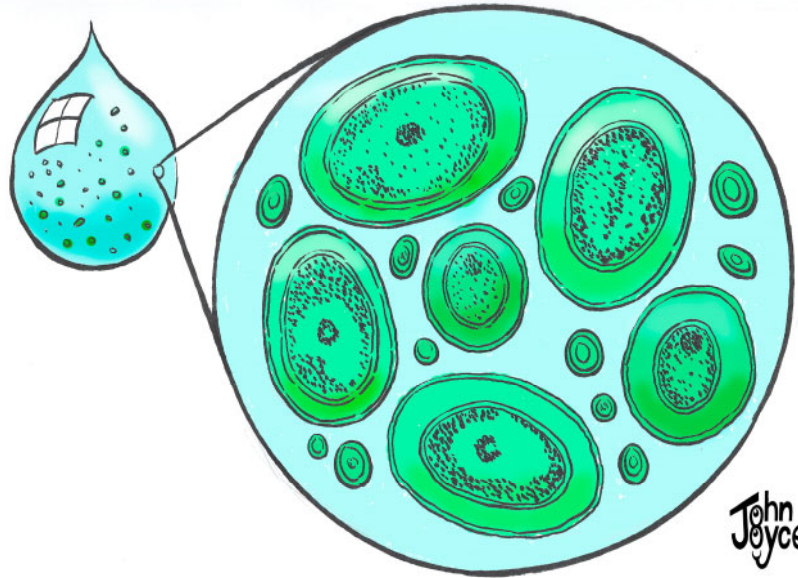




## The Invisible Universe

By John Joyce

Avast there, Mateys!  
We must be thankful for every drop of water in the ocean.  
Let me explain why....



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There's an 'invisible universe' of plants and animals, which live in every drop of seawater. Microscopic marine plants called 'phytoplankton', each consisting of only one living cell are responsible for an estimated fifty to eighty five percent of all the oxygen produced across the globe. Yet phytoplankton are so small as to be invisible to the human eye except when really favourable circumstances, caused by increased nutrients and sunlight, allow them to grow and multiply by the million. This increased growth creates 'algal blooms' or 'Red Tides', so called because the sheer number of phytoplankton cells in the water causes the Sea to change colour.

Just as land plants provide the vital ecological service of removing carbon dioxide from the air and creating oxygen

for us to breathe so marine plants, such as phytoplankton and seaweeds, remove carbon dioxide from seawater and create oxygen for marine animals. In fact, it has been estimated that around half of all the oxygen created by terrestrial and aquatic plants on planet Earth comes from tiny marine phytoplankton – enough, quite literally, for 'every second breath' that we take! The remainder comes from the larger seaweeds such as kelp, from the rain forests and other terrestrial plants.

Just like land plants, phytoplankton need sunlight to grow and reproduce. This means they can only thrive in the upper layers of the Ocean down to around 250 metres, where light can penetrate.

The most active of the 5,000 known species of phytoplankton is *Prochlorococcus*, a type

of marine cyanobacteria, which contains the green pigment chlorophyll. Like land plants, it is capable of absorbing carbon dioxide and releasing oxygen using energy from the Sun by a process called 'photosynthesis'. *Prochlorococcus* is so small that millions of its tiny cells can fit inside a drop of water. But this species alone is so abundant in the Ocean that it produces around twenty percent of the oxygen we breathe. In fact, the total amount of ALL phytoplankton in the Ocean at any one time has been estimated at over a BILLION tonnes, with forty five billion tonnes created and dying over the course of a year.

So take a deep breath . . . and thank the Ocean for every second breath that you take!

## How to Draw a Whale!



Draw the Body



Put in the Face



. . and the spout!

Follow Black John the Bogus Pirate and his crew on Facebook at <https://www.facebook.com/BlackJohntheBogusPirate/>

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