

Anglesey Sea Zoo & Marine Resource Centre
Guided Tour Supplementary Information
Last Revision - March 2011



Here we present a summary of a guided tour through the Anglesey Sea Zoo during which the points detailed below may be related in more detail, along with more general information on all species within the aquarium, as well as those are crucial to the functioning of a healthy marine environment, but are too big (or small) for us to care for. The broad subject headings below are not necessarily the only subjects open to discussion or explanation during any tour of the Anglesey Sea Zoo, and the level of detail depends on both the choice and the age of the visiting group.

1. The Human Perspective

The earth is over 70% water, so Planet Ocean may be a more appropriate name than planet earth! The majority of the world's population lives within 10 miles of the coast. The number of people moving to the coast is increasing every year, therefore the world's coast and coastal oceans provide a living and sustenance to the majority of the earth's population, for this very reason these places are under immense environmental and social pressure.

The coastal seas and of the earth provide to humans (free of charge) many services which are not immediately obvious. These services include direct income from living in a coastal location through activities such as fishing, coastal trade, and tourism, to abstract and indirect benefits such as the provision of a cleaning service by estuaries so that eventually, as the water from rivers is cycled back through clouds, it is once more safe for people to drink.

2. Climate and Environment

The world's seas ultimately control the global air temperature and therefore the earth's weather patterns, from how much and how often it rains, to where and when rainfall occurs, and even cloud formation. All of this control is enabled due to distinct water masses, which are essentially packages of chemically and thermodynamically different water bodies within the sea, like building blocks made up of seawater. These travel the world at different temperatures causing phenomena such as ocean currents, wind, and even hurricanes and cyclones.

For older groups, more complex ideas such as the fixing of carbon from the atmosphere to the sediments of the deep oceans and global carbon fluxes can be discussed in this context. In addition, we introduce the concept of carbon neutrality (with one example being bio fuel production) and how the sea plays a crucial role in defining the balance point which results in theoretical carbon neutrality. The definition of this point may mean that the sea may hold a solution which allows us to sustainably harvest the resources of our planet, instead of the current trend of unsustainable exploitation, which is now beyond a level from which the earth and her oceans can reasonably be expected to recover.

3. Biodiversity

The sea contains more creatures than all the continents on earth, many of these have never been seen (by humans), and more are discovered each year. Many of these sea creatures are absurd, but truly wonderful, some could even be mistaken for aliens, with the appearance of being too unbelievable to really exist - ever come across a deep sea octopus that swims with its ears?

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We really know very little about the sea compared to the terrestrial environments of our planet, which makes it even more important that we can protect the oceans and the species that live there. This is an essential idea in biology and conservation because even when we cannot see something that exists, this does not make it unimportant.

This subject is also a great stepping stone to the discussion of what biodiversity means to us and does for us, along with the major differences in terms of ecosystem resilience of marine and terrestrial ecosystems.

4. Energetics

Why are flatfish flat? Why do some face right, while others face left? Are there any advantages to being colourful in the sea? How much does it cost to change sex? These may seem strange questions but they are exactly the sort of issues that some marine creatures have to consider on a daily basis.

Energy and its direct conservation is the single most important factor in the lives of most plants and animals. During this talk and tour we discuss ideas and concepts like the hydrodynamics of fish, why humans invented remote controls, and the fact that everything that is alive now, has ever lived, or indeed will evolve, is in the full time business of saving energy. Odd but fun!

A guided tour or subject talk can be made as specific or general as required, and themed around any of the issues described above, or even broader economic and socioeconomic concerns, to give an greater understanding of the economic and social role of global oceans. We are happy to discuss any subject and our experts will hopefully be able to come up with a tour or talk to meet your needs! Please talk to us about your requirements. Below are brief answers to the two questions most often asked of our biologists at the Anglesey Sea Zoo ...

Why is the Sea Salty?

The Water Cycle, which itself is critical in explaining oceanic water movements, weather patterns, and the diversity of the oceans and ultimately the distribution of all life on earth is what controls the saltiness of the seas. Some are more salty than others, while some change the extent to which they are 'salty' in different seasons, or even across years. While this might sound complicated it is not so difficult to understand, and in fact all starts with the way in which rivers and rainwater runs from the land into the sea, carrying lots and lots of dissolved chemicals. It is these chemicals that make the sea salty.

Right now, the seas are around 3.5% salt, and if the seas dried up, enough salt would be left behind to build a 180-mile-tall, one-mile-thick wall around the equator. Enough to go to the moon and back several times! More than 90 percent of that salt would be sodium chloride, ordinary table salt.

So Why is the Sea Not Getting Saltier?

The oceans are getting saltier every day, but the rate of increase is so slow that it is virtually immeasurable. The reasons for this slow rate of change are complicated but most scientists believe that what originally made the seas salty was the very harsh chemical atmosphere in the days when the earth was still young, around 4.5 billion years ago! But now that the atmosphere is more settled, the process has become much slower, so from one year to the next, in our lifetime we're not going to notice, and neither are the many millions of creatures whose home is the sea.