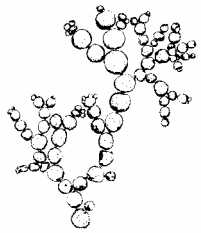
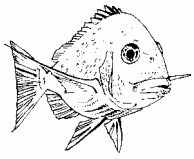
INTRODUCTION TO ROCKY SHORE SPECIES

Identification

KINGDOM PROTISTA – ALGAE

PHYLUM	COMMON NAME	EXAMPLE	Pages in "Life on the Rocky Shore" book to identify other species
Phylum Chlorophyta	Green algae	eg Neptune's Necklace *Hormosira banksii* 	pg's 5, 6 & 7
Phylum Phaeophyta	Brown algae	eg Paddle (common) weed *Ecklonia radiata* 	pg's 7, 8, 9, 10 & 11
Phylum Rhodophyta	Red algae	eg Leafy carrageen *Gigartina circumcincta*	pg's 12 & 13

KINGDOM ANIMALIA - ANIMALS

PHYLUM	COMMON NAME(S)	EXAMPLE	PAGES in "Life on the Rocky Shore" Book
Phylum Porifera "pore-bearing"	Sponges	eg Yellow sponge *Aplysilla sulphurea*	pg's 14 & 15
Phylum Cnidaria (used to be called coelenterates) "stinging cells"	Jellyfish Sea anemones	eg Red sea anemone *Isactinia tenebrosa*	pg's 14, 16 & 17
Phylum Mollusca "soft-bodied"	Mussels, scallops, limpets, whelks periwinkles, chitons & paua	eg Snakeskin chiton *Sypharochiton pelliserpentis*   eg Ornate limpet *Cellana ornata*	pg's32 - 43
Phylum Arthropoda Subphylum Crustacean "jointed feet"	Barnacles, crayfish, shrimps and crabs	eg Columnar barnacle *Chamaesipho columna* 	pg's 24 - 31
Phylum Echinodermata "spikey skin"	Sea stars, snake stars, feather stars, sea urchins, sea cucumbers and brittle stars	eg Brown sea urchin *Evechinus chloroticus* 	pg's 44 - 47
Phylum Chordata	Sea squirts, fish, sharks, rays	eg Snapper *Pagrus auratus* 	pg's 48 & 49

How they all feed

Feeding Methods

Grazers

On the rocks in the **intertidal** community (which is the area between high tide and low tide) microscopic algae grows– it is mostly diatoms. Microscopic is very something very small, so this type of algae is usually called **microalgae**. This is what most grazers eat. They graze the algae on the rocks much like a cow grazes a paddock, however the grazers teeth are on a long organ which contains many, many teeth. This long organ is called a radula (see picture pg 59). The species who are grazers are generally the ones who live on the rocks – these are chitons, limpets, periwinkles, top shells and cat's eye's. Another grazer is the sea urchin, however they graze on much larger algae, which is called **macroalgae** (macro means big) the long stalked paddle weed which grows in the **subtidal** community (below low tide). Paua also graze on macroalgae species.

Filter feeders

The ocean contains plankton (which means it is floating around in the water). Some plankton is just tiny, microscopic algae not attached to rocks – it is called **phytoplankton**. The rest of the plankton are tiny microscopic animals called **zooplankton**. Some rocky shore species eat plankton. They do this by sucking in the saltwater and filtering it. So they filter all the plankton out of the water that goes in thorough their shell. Species who are filter feeders are generally sessile which means that they are stuck to the rock! So the intertidal **filter feeders** can only feed when the tide is in! The filter feeders on a rocky shore are the barnacles, mussels and rock oysters.

Scavengers

These species move about looking for anything to eat. **Scavengers** include cushion stars, hermit crabs, red shore crabs and most other crab species.

Predators

Predators generally eat the grazers and/or the filter feeders. For example, oyster borers eat oysters and barnacles. The whelks eat other molluscs including oyster borers.. On the rocky shore the 11-armed starfish eats mussels. Snapper eat kina and crayfish.

Who eats who

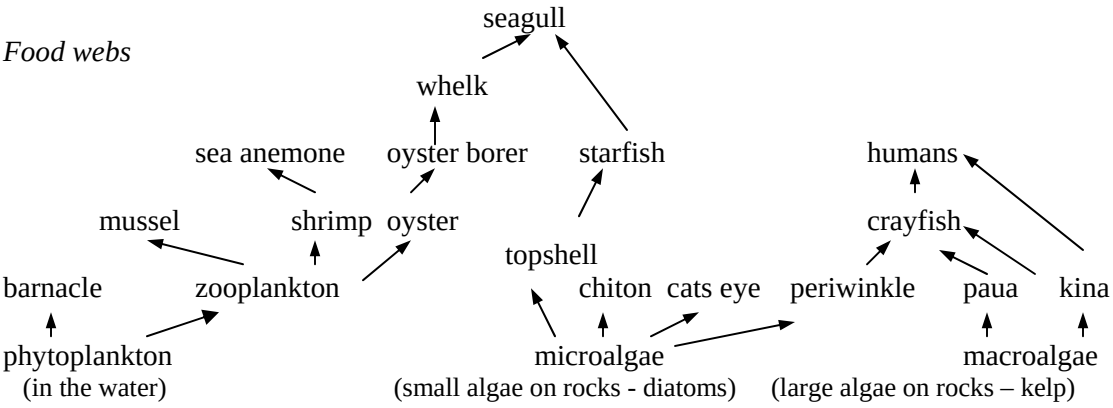
Food chains

The many different **food chains**

eg phytoplankton → oyster → oyster borer → whelk → seagull

can be summarised in a **food web**.

Food webs



What could effect diversity and abundance

Biotic (living) factors

Species relationships

A species feeding method (eg **predation**) could determine if that species exists in a community or not and if it is, the amount of its food source will determine how many individuals of that species are in that community. This will be determined by **competition** for food and how many of it's own predators are present. In other words, if there are a lot of oysters then this will determine the number of oyster borers present – with a high number of oysters you would expect a high number of oyster borers unless there are lots of whelks (whelks eat oyster borers)! One amount of one species is generally determined by the amount of another – either by what it eats, or by what eats it! On the rocky shore there is also high competition for space! As soon as one individual is eaten more space is made for another. For the other species relationships see your notes and pg's 66 and 67 of the Life on the Rocky Shore book.

Abiotic factors

Temperature

Some species are able to handle a large change in temperatures. As the tide goes out, rock pools are left. The water in these rock pools change dramatically before the tide comes back in. If it is a hot day the temperature will rise significantly, and at the same time the salinity (amount of salt) will go up as water evaporates. If the rock pool contains a lot of animals then oxygen levels will go down as the animals use up the oxygen, at the same time they will produce wastes.

The intertidal species that are high on the shore have no water for just over 6 hrs. These species can handle not drying out (desiccation). If a species is not able to withstand drying out then it would be present lower down in the intertidal community, perhaps only found in rockpools in the intertidal and in the subtidal.

Substrate Type

Generally on a rocky shore the substrate type would be rock. However sometimes within a rock pool for example the substrate on the bottom could be sand or shells or small pebbles. The substrate type determines what lives in that space. For example, you only find barnacles on rock, not on sand or pebbles. Most algae species will only grow on rock however you might a length of algae attached to a stone which has been slightly buried in some sand.

Wave action

As the tide goes in and out the species on the rocky shore will be hit by waves at some point depending where they live. If a species is not able to handle (ie not well adapted) being knocked off by waves then this will restrict where it lives – it may not be in the intertidal community at all. If a species is well adapted to be able to stick to the rock then it will most likely be found in the intertidal community.

Water availability

With the saltwater comes oxygen and food. If a species lives high up the intertidal community then it is unable to feed for 6hrs out of every 12hrs due to the tides. Therefore not many species live in this area so the high tide zone has a low species diversity.