



Pathfinder Honour: Trainer's Notes

Marine Invertebrates 1



Instructions to Trainers / Instructors of this Honour

Thankyou for being involved with this Honour. These notes have been developed to assist in teaching / instructing this honour. We recognise that there is much more information available and we are grateful that you should share your expertise.

Please remember that Honours are designed to develop our Pathfinders in many ways; their interests, their knowledge and their relationship with their Saviour and Creator. Your enthusiasm and creativity will have a huge impact on those doing the honour.

To complete an Honour, the following (where applicable) must be completed satisfactorily:

- Physical and Practical Requirements.
- Honour Workbook.
- Honour Assessment Sheet. (*On SPD Honour Website but Leader's level access is required*)

Additional Reference Material

Acknowledgements

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REQUIREMENT 1: What is a Marine Invertebrate?

A marine invertebrate is an animal that does not have a backbone and lives in the sea. Many live permanently attached to the ocean floor and look more like plants than animals.

REQUIREMENT 2: Identify and observe in their natural environment 10 Marine Invertebrates with at least one example from at least three different phylum. Some of the most common phylum into which Marine Invertebrates are classified are:

- Porifera (sponges)
- Cnidaria (jellyfish, anemones, hard and soft corals, hydroids)
- Mollusca (bivalves, gastropods, chitons, nudibranchs, sea hares, octopus, cuttlefish, squid)
- Arthropoda (crabs, hermit crabs, prawns, shrimps, barnacles)
- Echinodermata (starfish, brittle stars, feather stars, sea urchins, sea cucumbers)
- Annelida (bristle worms, tube worms)
- Platyhelminthes (flat worms)
- Nemertea (ribbon worms)
- Chordata (ascidians or sea squirts)

The habitats in which you will find Marine Invertebrates range from coral reefs, open ocean, sandy beaches, mud and mangroves, rocky shores and headlands; from warm tropical waters to cooler temperate waters.

It is impossible to provide information in this document on all the marine invertebrates you might identify and observe in your local environment. It is suggested that you obtain or borrow any of the readily available reference books on this subject in order to find out what marine invertebrates you are likely to discover in the area in which you intend to teach this honour.

As part of the trainer's notes for this honour, separate documents in PDF format are available for your use. These are:

- Marine Invertebrates Trainer's Notes_Extra Info
- Trainers Notes (Photo Guide)

While these documents will not necessarily provide information on all the Marine Invertebrates you are likely to find in your area, you might find them helpful.

The requirement is for the pathfinders to identify and **observe in their natural environment**, 10 marine invertebrates from at least three different *phylum*.

The Observation Sheet for this honour is a separate document (*Marine Invertebrates 1 Honour's Observation Sheet*) to the Honour Workbook so the pathfinders can record the marine invertebrates they have discovered.

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Following is an example of how the Observation Sheet should be completed.

Requirement 2			
Identify and observe 10 Marine Invertebrates in their natural environment with at least one example from at least three different phylum.			
Make a note of the following:			
Animal	Phylum	Where did you find it (eg rocky shore, tide pool, beach, reef)	What was it doing
<i>Example:</i> <i>Octopus</i>	<i>Mollusca</i>	<i>Reef</i>	<i>It was hiding under a rock but when disturbed it started changing colour</i>
1			
2			
3			

←

Use the above example as a guide to filling in the Observation Sheet attached to your workbook to record the ten different marine invertebrates you identify and observe.

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REQUIREMENT 3: Describe an interesting or unusual fact you have learned about the animals observed in Requirement 2; for example, how it feeds, how it moves, how it reproduces, or any other interesting or unusual fact.

In conjunction with Requirement 2, the pathfinders are to learn at least one unusual or interesting fact about the marine invertebrates they discover and observe. You will be able to find lots of information in readily obtainable reference books on this subject. You may also find the separate documents that are available with these Trainer's Notes helpful.

The pathfinders are to write the unusual or interesting fact they have learned about the marine invertebrates on the Observation Sheet. Following is an example of how it should be completed.

Requirement 3
Describe an interesting or unusual fact you have learned about the animals you have observed.
Interesting/Unusual Fact
<i>Octopus change colour to escape enemies, hide when hunting or show emotion. The skin contains small, elastic bags of colour which shrink and expand to pale or colour the animal.</i>

Using the above example, write something interesting you have learned about those marine invertebrates you have identified and observed in this section of the Observation Sheet attached to your workbook

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REQUIREMENT 4: There are many interesting relationships between marine invertebrates and other marine invertebrates or other sea creatures (eg the clown fish and the anemones). Choose three such relationships and write a paragraph about each of them.

There are many relationships between marine invertebrates and other marine invertebrates or other sea creatures. Following are examples of just some of them.

Clown Fish and Anemone

Anemone fish gain protection from the stinging cells of sea anemones. The stinging cells of the anemone kill small fish on contact, which they then convey to their mouths for food. However, anemone fish, also called clownfish, acquire an immunity by gradually covering itself with a layer of mucous secreted by the anemone that stimulates the anemone not to fire off its stinging threads. The anemone fish live in the anemones and so gain protection from predators. An anemone fish cannot survive without an anemone and is never seen for long without one.

Goby and Shrimp

A few species of snapper-shrimp live with goby fish. These shrimps, usually in a pair, excavate a deep burrow which a pair of gobies share with them. The fish gain shelter and protection in the shrimp's burrow and in return, the fish, by a quick movement of their tail to propel them down the burrow, warn the shrimps of impending danger. The shrimp maintains the home burrow while the fish keeps watch and signals when it is safe to bring out debris.

Porcelain Crab and Anemone

The spotted porcelain crab lives in the shelter of sea anemones. They keep from being captured and eaten by the anemone by moving around among the tentacles.

Cleaner Shrimp

Most crustaceans spend daylight hiding, but a group of shrimps are day shift workers. Cleaner shrimps wait at stations for fish to arrive and signal by the way they hang in the water that they wish to be cleaned. The shrimps crawl over them, even into mouths and under gill covers, removing and eating small parasites. They also nibble the mucus coating the fish.

Feather Stars and Crustaceans or Small Fish

Small shrimps and crabs, brittle stars or small fish frequently live among the arms of feather stars. There is plenty of food because feather stars only live near water currents loaded with plankton. Very few animals try to eat feather stars, so the creatures living with them are safe from predators.

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REQUIREMENT 5: Visit a marine habitat at night and by means of a flashlight, observe the activity of animals on shore and in the water and present a written report on your observations.

You will be surprised at what there is to discover at night out on the reef or along a shore or rocky headland. This is when most marine invertebrates come out to feed. Take the pathfinders on a night excursion so they can discover lots of marine invertebrates that they wouldn't normally see in daylight hours. Don't forget to take your torch with you so you can find and observe all those interesting critters out there.

When the pathfinders get back they will need to write a report on where they went, what they did and what they observed. There is space provided in the workbook for this report.

REQUIREMENT 6: There are many dangerous marine invertebrates. Identify at least three that are found in your area and tell why they are dangerous.

Following is information on some of the dangerous marine invertebrates. Information on other dangerous marine invertebrates in your area can be found in readily available reference books.

Cone Shells

Cone shells are hunters. They inject poisonous saliva into their prey through sharp grooved teeth at the tip of a retractable proboscis. The poison is extremely powerful and acts almost instantaneously on the victim. The poison has to act quickly to be effective for there would be no point in the cone shell poisoning its prey merely to watch it swim or crawl away to die out of reach. Two cones known to have caused fatalities to humans are the *Conus geographus* and *Conus textile*.

Blue Ringed Octopus

The blue ringed octopus possesses a deadly venom capable of killing humans. It feeds on crabs and molluscs which they paralyze by injecting poison with their beak-like jaws.

Box Jelly Fish

At each of its four corners, it has clusters of long trailing tentacles, loaded with batteries of venomous stinging cells, whose touch may be fatal or cause severe injury.

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Stinging Hydroids and Fire Coral

A brush with stinging hydroids or fire coral may result in a mild to rather severe sting with persisting rashes and itching. The polyps have tentacles armed with stinging cells. When brushed against, threads loaded with toxins are fired.

Sea Urchins

The long slender needle-like spines of some sea urchins break off easily and lodge in the flesh. Because of their barbs, they are difficult to remove and may fester. Another sea urchin, the flower urchin, has a spectacular array of densely packed, waving nippers that reach out in every direction. They look like three-petalled flowers, but they are equipped with poison glands and contact with them is dangerous. It can cause muscle weakness, shock, neurological damage, respiratory distress and sometimes death.

Sea Cucumbers

Sea cucumbers contain toxins and if handled, care should be taken not to let them come in contact with the eyes.

Crown of Thorns Starfish

This starfish is widely known for its devastation of coral reefs. The upper surface of this large starfish is a bristling mass of stout spines, each coated with a thin layer of skin that secretes an irritant poison. A puncture wound from the crown-of-thorn's spines is painful and may become inflamed and swollen.