



Pathfinder Honour: Trainer's Notes

Shells



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

Shell Honour Trainers Notes_Power Point_I&L Weir 2May07.

The Seashells of New South Wales <http://seashellsofnsw.org.au/>

Look for books on Australian shells by Neville Coleman

Trainer's notes on identifying New Zealand shells

Acknowledgements

Ian and Leanne Weir for sharing their enthusiasm and knowledge of shells

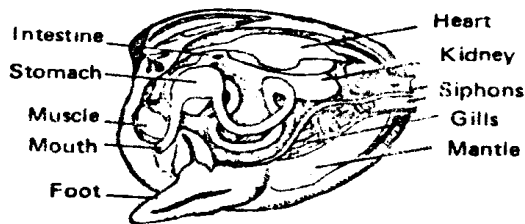
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REQUIREMENT 1. What is the meaning of the term MOLLUSC ?

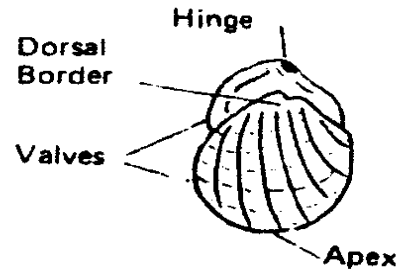
A mollusc is an animal with a soft body usually protected by a shell. Snails, mussels, oysters, and cockles are molluscs.

REQUIREMENT 2: What parts of a mollusc are the following?

- | | |
|-----------|------------------|
| a. Mantle | f. Operculum |
| b. Ribs | g. Teeth |
| c. Apex | h. Dorsal border |
| d. Foot | i. Canal |
| e. Valve | |



THE INTERNAL ORGANS OF A BIVALVE

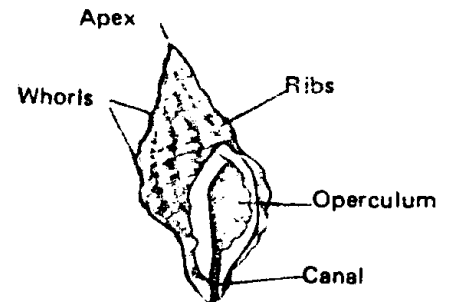


Mantle: Many molluscs have an outside skin, which lines the shell and more or less covers its outside surface. This is called the mantle. A liquid which comes from glands in this mantle becomes "shelly" when it comes into contact with water or air and forms the animal's shell - which is made up mainly of lime from the food it eats, plus a certain amount of animal matter.

Ribs: In the edge of the mantle are many secretory glands. These glands, along the edge of the mantle, are of different sizes and shapes, so that ribs and protuberances produced by the glands give each species its characteristic shell.

Apex: This is the tip or small end.

Foot: All molluscs have a foot by which they travel, burrow or are attached to a permanent spot. It is the most conspicuous part of the animal besides the shell. Its broad flat shape enables the animal to creep around over rocks, sand and reefs.



Valve: Found in bi-valve (or two-valve) shells. The valves are joined together at one end by a hinge.

Operculum: That is a horny or shelly trap door, which blocks the entrance and protects it. The foot usually controls it. Many univalves have an operculum. Some operculums are beautifully coloured and are used for making personal ornaments.

Teeth and Mouth: Univalves also have a "radula" or tongue - a long ribbon-like organ bearing large numbers of tiny teeth, which break up the food of the mollusc. All molluscs have a mouth of some sort or other.

Dorsal Border: This is the back edge of a bi-valve shell, near the hinge or the side of a univalve farthest from the apex.

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Canal: The groove near the opening of spiral shells.

REQUIREMENT 3

a) Name five different habitats where living molluscs are found

1. Land: Snails
2. Sand/Rubble: Olives, Helmets, Pipis and Sand snails.
3. Rocks: Limpets, Chitons, Mulberry.
4. Coral & reefs: Cones, Tritons, Cowry and Clams.
5. Mud & Mangroves: Bubbles, Ears, Murex, Whelk and Oyster.
6. Continental Shelf: Scallops, Cones, Tritons, Tusks, Augers and Volutes.
7. Deep Ocean: (very few) Nautilus and Horn shell

b) List locations in the world where large numbers of shells are found.

The Philippines, Cuba, Florida (U.S.A.), Mexico, Japan, China, Great Barrier Reef (Australia), New Caledonia, New Zealand, Fiji, New England and Maine (U.S.A.).

REQUIREMENT 4. Describe the movement of shells from place to place.

Many molluscs travel in their early stages but then settle and become permanently attached to one place by their foot. Some bivalves, particularly scallops, are able to swim by opening and shutting their shells and thus forcing themselves along slowly by protruding and contracting a long foot. Most univalves glide or creep over the floor of the sea by wave-like movements of the foot, which also frequently gives off slime to lubricate the way.

REQUIREMENT 5. How do shell animals protect themselves?

The work of a shell is mainly to protect the mollusc or animal inside. It does this by closing quickly when danger approaches, or by holding tightly to a rock or solid surface. Many of them become covered with barnacles or other sea creatures that make them look like their surroundings. If a shell becomes damaged the mantle does repair work. Many shells, including most oysters, have the power of producing a secretion, which covers up any irritation. This is how pearls are made.

REQUIREMENT 6. How are shells made and from what materials are they made?

The process of making the shell is going on always with interruptions now and then due to the reproductive cycle, or small food supply, change in temperature, or chemical composition. In the edge of the mantle are numerous secretory glands. Certain glands produce the slimy substance which is laid in layers until the shell is complete. These glands are along the edge of the mantle and are of different sizes and shapes, so that the ribs produced by the glands give

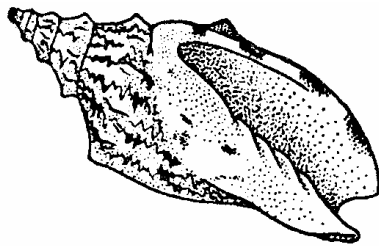
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each species its special shell. Scattered among these glands are others, which secrete pigments, producing the varied designs, and still others which produce horny substances.

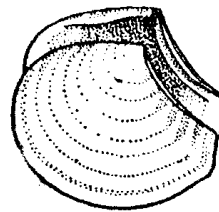
REQUIREMENT 7. List and explain five uses made of shells by man.

1. Food: many of the larger molluscs are cooked in their own shell.
2. Buttons and Buckles: usually the pearl or trochus shells are used.
3. Shell Grit: ground up shells.
4. Dye: this is obtained from certain squids.
5. Birds: birds sharpen their beaks on cuttlefish.
6. Bailing Out: baler shells used for bailing out canoes.
7. Decorations: large shells are carved and made into lamps.

REQUIREMENT 8. Explain the terms UNIVALVE and BIVALVE as applied to shells.



UNIVALVE SHELL



BIVALVE SHELL

Univalve: One piece shells

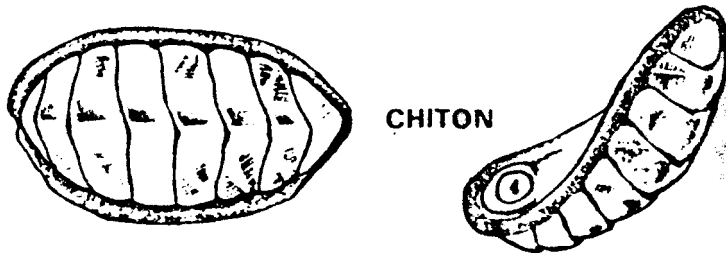
Bivalve: Consisting of two separate parts joined by a hinge at one edge.

REQUIREMENT 9. Name in common terms five different classes of shells, and have in your collection a shell for each class. *Pictures of shells are preferred to taking live specimens.*

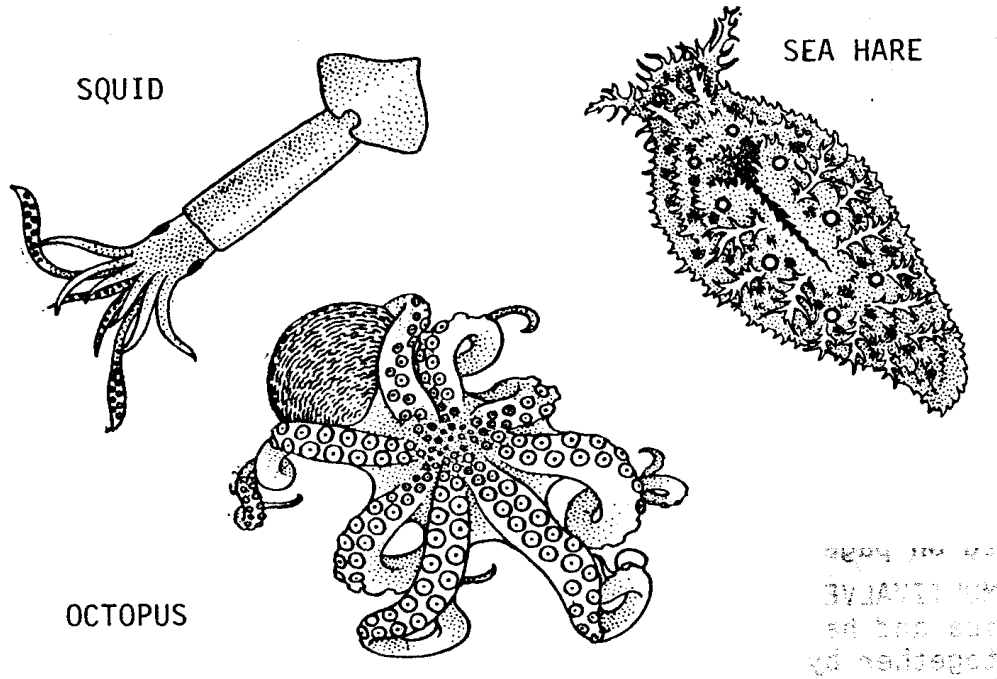
1. **Bivalves:** These live in the sea or fresh water but never on land.
2. **Univalves:** This is the largest group and may live in the sea, in fresh water, or on land.

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3. **Multivalves (ie Many Valves):** These live only in the sea and have a shell jointed in eight places, held together by a surrounding girdle. At low tide these may be found sticking to the rocks, where they will be covered at high tide.



4. **Tusk or Tooth Shells:** These live only in the sea. They are in one piece, in the form of a tube open at both ends. These lie buried in the mud in deep water, with only their narrow ends protruding and are not very well known.
5. **Armed Molluscs:** These have 8, 9, 10, or more arms. Some have shells externally, others internally, and in others there is no shell at all. They live only in the sea and many are well known, such as the cuttle fish, squids, sea hare, octopus, etc.



REQUIREMENT 10. Make a collection of 20 different shells and tell where each is found, when it came into your possession, and classify it. Pictures of shells are preferred to taking live specimens.

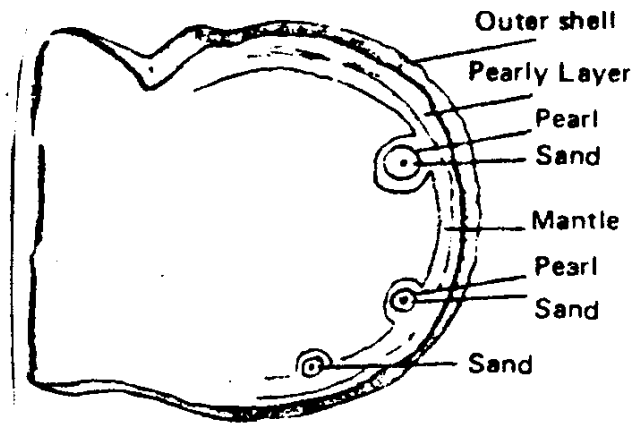
REQUIREMENT 11.

- a. What is the source of pearls? Describe how a pearl is formed.

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An oyster pearl is shown in three stages of development in picture below.

Pearls are formed by the oyster's secretion, which surrounds the irritating object, a speck of sand.



b. What striking lesson does the pearl teach us? (Read and discuss Christ's Object Lessons, pages 115 - 118.)

"The righteousness of Christ, as a pure, white pearl, has no defect, no stain."
Christ's Object lessons, page 115.

"Salvation is a free gift, and yet it is to be bought and sold. In the market of which divine mercy has the management the precious pearl is represented, bought without money and without price. In this market all may obtain the goods of heaven."
Christ's Object lessons, page 116.

REQUIREMENT 12. Answer the following questions: (The following text may be of help in answering these questions. They are not in order)

Bible Texts: Lev. 11:9, 10; Acts 16:14; Isa. 50:2; Rev. 21:21; I Tim. 2:9; Gen. 1:20, 21; I Kings 4:33; Ps. 104:25; Matt. 7:6; 13:45, 46; Job 28:18.

- a. Water creatures were created the fifth day. **Gen. 1:20,21.**
- b. The number of water creatures is innumerable. **Psalms 104:25**
- c. Water creatures perish out of water. **Isaiah 50:2**
- d. Job considered coral of great value. **Job 28:18**
- e. Solomon was acquainted with marine life. **1 Kings 4:33**
- f. Jesus twice used a shell product to teach a spiritual lesson. **Matt 7:6; 13:45, 46.**
- g. A businesswoman was engaged in selling the famous purple dyes secured from the shellfish Mediterranean Murex. **Acts 16:14**
- h. Paul condemns the wearing of pearls. **1 Tim. 2:9**
- i. Shell creatures are unfit for food. **Lev. 11:9, 10.**
- j. The twelve gates of Holy City are twelve pearls. **Rev. 21:21**