Seaweek 1997

Celebrate the sea - Explore the Deep

Lin Fairlie

Understanding the theme

By exploring the deep, marine education considers the little known and explored ecosystems and inhabitants of the deep sea. The deepest parts of the ocean (about 11 000 metres) are deeper than the highest parts of the land. From one kilometre deep, the ocean becomes an environment of total darkness. Food is scarce, there is no plant life, creatures are found at only 1% abundance of that of the surface, it is cold and the pressure is enormous.

Much is still to be discovered in the deep sea. In 1976 event fields were discovered by the Alvin submersible off the Galapagos Islands. These deep sea vents, created by volcanic activity, were found to contain amazing communities of marine species evolved around bacteria that can produce food in the absence of light.

More is said to be known about the moon than the deep sea, therefore this is an important theme which sparks imagination and interest in the ocean environment. By developing a theme around the deep sea you can also explore:

- Diversity and adaptation
- Currents and climate
- Marine resources, mining and exploration
- Australia's international responsibilities as a signatory to a number of treaties and agreements concerning birds, mammals and fishing etc
- Fishing, fishing methods and managing fish stocks
- Pollution, ballast water, ocean dumping, radioactive, toxic and industrial waste and maritime law

Exploring the theme - event ideas

'Taking a deep dive into the dramatic arts' - Creating an ocean mural through a story telling session.

Deep Sea murals created by Beaumaris Primary School

Photo courtesy Jodi Piecas

Creating an ocean mural

What

Children watched a story told with puppets and then participated in the creation of a giant ocean mural.

Where

At the Victorian Gould League Open Day, Melbourne.

How

Two adults presented a story about the adventures of a young sperm whale, through word and puppet movements. The storytellers set the scene by describing the whale calf's early years and some sperm whale facts.

The whale's dive was used to introduce physical aspects of the deep sea as well as a focus on a variety of animals in the different sections of the water. Finally the calf gets to the bottom and is suddenly surprised by a giant squid who chases her up until the water turns lighter again and she leaps out into the air sucking in a big gasp of air. The puppets were made from recycled junk.

After the story telling session, the children were asked to work on the creation of a giant ocean mural. Their drawings built up a picture of the life in the ocean levels - sunny, twilight and black as night.

Why

This educational activity promoted and used the creative arts as a learning medium. Language, art and imagination are very effective teaching tools to explore education concepts or themes. With creative arts you can turn the serious business of marine education into a fun activity.
Deep diving Sperm whales both evoke mysteries of the deep and make a perfect guide to the deeper regions of the oceans. After the story session the children could consolidate what they had learnt by working on the ocean mural.

Extending the theme - class activities

Adapted from the Primary School Booklet written by Ann Flemming and Jim Grant

Black Devil

Illustration courtesy Jan Oliver

Activity 1: The Depth Chart

Background

So far, exploration of the deep has reached about 4.5 kilometres, though exploration of much deeper regions has begun. The deepest regions of the sea are about 11 kilometres.

Aim

- to gain some concept of the scale of the depth of the sea and the distribution of organisms in it.

Activity

- Find a piece of card or paper 2 metres long.
- Divide it into ten scaled 500 metre sections. The top section is above the ocean surface, it is for your heading and some sort of object to establish scale e.g. a bridge or ship. The other nine sections will take your chart to a depth of 4500 metres.
- Research the ocean. Mark where light ends (1000 metres) and draw in plants and animals, at the level in the ocean where they are found.

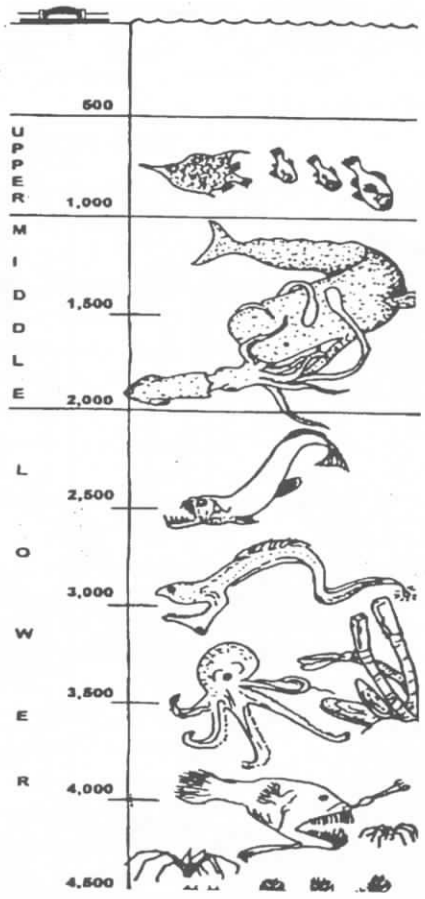

Photo courtesy Gould League

Activity 2: Chat with a Scientist

Adapted from the Secondary Activity Booklet in the Seaweek'97 Education Kit by Jill Strachan

Students can undertake a journal search but why not ask a scientist.

What to do

- Create a series of questions which can be answered by a panel of marine scientists on the internet at http://oceanlink.island.net/
- Example questions:
  - What deepsea fish can we buy?
  - Are there any deepsea vents in Australian waters?
  - How deep are the seamounts near Tasmania and what new marine life was discovered there?

Activity 3: The Weight of Water

Adapted from the Primary Activity Booklet in the Seaweek'97 Education Kit by Jim Grant and Ann Fleming

Background

Water is heavy. It is much, much heavier than air. The weight of water pressing down on the creatures deep in the sea is massive but they develop there and are not affected by it. They are drastically affected when hauled up to the surface and some parts of them explode as the pressure in their body is released. If a person was not protected by a submersible in the depths they would be crushed. We experience the pressure created by the weight of water ever day when we turn on the tap. The weight of water in the dam (which supplies us with tap water) pushes the water out under pressure.

Aim

- to investigate the weight of water and the effects of pressure.

What to do

- Fill a large bucket with 25 cm of water. What would be the weight of a column of water a metre high of a similar size? (just multiply by four). What would be the weight of water pressing down on a creature the size of the base of the bucket at a depth of 4, 000 metres (four kilometres)?
- If your school has very fine scientific scales you can compare the weight of air and water. Weigh an uninflated balloon and write down its exact weight. Blow it up (but not too hard) then measure the circumference and weight it again. There should be a slight increase in weight. That increase is the weight of the air in the balloon.
- Now carefully fill another similar balloon with water until it has the same circumference. If it looks like bursting do not proceed. Weigh it carefully. How many times heavier is water than air?

Activity 4: Pressure from a bottle

An original experiment by Bob Moffatt from Seaweek 2000 kit.

Illustration courtesy Jan Oliver

Photo Courtesy Wet Paper

Aim

- To show pressure increases with depth

What to do

- Use a pin to make 4 holes is the side of a drink bottle
- Place tape over the holes and fill the bottle
- Over the sink, quickly remove the tape and observe the effect of water pressure and depth

Personal Actions

Everything we do has an effect somewhere else, from the highest mountains to the deepest seas:

- When shopping choose products that have not come as a result of destruction to deep sea marine habitats e.g. ask/read how the seafood was caught and find out what effect the fishery is having on the ocean ecosystems.
- Research and discover more about our amazing oceans, from the beach to the deep sea. Learn from and enjoy videos, CD Roms, internet sites, books and magazines.