

## Sustainability and Conservation

Why not get a hands on experience with your students at Irukandji Shark and Ray Encounters to learn about the oceans ecosystems from Apex Predators to Primary producers.

This Lesson plan is designed for students to observe and study the marine environment through interactive educational talks on Elasmobranch, with an all important message of ocean conservation.

Students will be able to

Irukandji Shark and Ray encounters is an new exciting and innovative method for students, which will further develop skills in planning and conducting investigations. Students will be lead through the inner workings of aquariums in a safe and informative education program, which is designed to provoke scientific thinking and problem-solving in teams. The activities included will provide content to help teachers meet the requirements of HSC syllabus on three topics detailed below;

- describes the range of organisms in terms of specialisation for a habitat
  - analyses the interrelationships of organisms within the ecosystem
    - identifies and describes the evidence for evolution
      - biological evolution
      - perform first-hand investigations
- describes the mechanisms of evolution and assesses the impact of human activity on evolution
  - Grasp the concepts of Sustainability

Our Program will offer students a chance to get close with some of Australia's endemic shark and ray species, during their time at that the Centre they will be encouraged to analyses and report on all aspects of the Chondrichthyans and the marine environment.



## Learning Environment

Core component is Group Work

- Ray Lagoon
- Tawny Terrian
- Fiddler Flats

## Materials

- Pencil
- Activity sheet
- Ruler and clip board

## Steps

*Students and teachers can pick from three topics; an analyses on the impact of human processes on biodiversity within a marine ecosystem; evaluation of the impacts of anthropogenic activity on the interactions of marine organisms and their environment. Assessing describes the mechanisms of evolution and assesses the impact of human activity on elasmobranch populations. Irukandji Shark & Ray Encounters has resources to help you pre-teach this information. Please see the section ,Helpful Information' below for details of pre-teaching material.*

**Step 1: Briefing approximately 10-15 minutes**

Students will be lead to our briefing hut, were they will be taught and explained too about how to interact with Elasmobranches safely by a qualified aquarist.

**Step 2: Getting Changed 20 minutes**

Students will be given a chance to get changed and store all their valuables

**Step 3: Before getting wet Tawny Terrain 10 minutes**

This is where students will learn about tropical marine species in particular a 2.7 meter Tawny nurse shark and given a hands on demonstration on what do in the water in the main tanks.

### Objectives

- *describes the range of organisms in terms of specialisation for a habitat*
- *analyses the interrelationships of organisms within the ecosystem*

**Step 4: Getting wet Ray lagoon 25 minutes**

This is where students will get a hands on experience feeding, touching and interacting with elasmobranches and teleost within their environment

### Objectives

- *interrelationships of organisms within the ecosystem*
- *identifies and describes the evidence for evolution*
- *biological evolution*
- *perform first-hand investigations*

**Step 5: Getting Change and heading over to Fiddler flats 20 minutes**

This is where students will get a hands on experience feeding and observing ray species whilst an aquarist talks about the various types of life strategies employed by elasmobranches

### Objectives

- *describes the mechanisms of evolution and assesses the impact of human activity on evolution*
- *Grasp the concepts of Sustainability*

**Step 6: Fill out the field work assessment 20 minutes.**

*Students will be given a chance to wonder the aquarium and obtain the relevant information for their reports*



# Helpful Information

Pre-visit preparation: The Irukandji Shark and Ray Encounters has resources to help you pre-teach this information. See the Irukandji Shark and Ray Encounters Conservation Page click on Australia's Sustainable Seafood Guide for information around sustainable fishing methods and seafood choices here: . For information regarding the Australia's Sustainable Seafood Guide Online, including a printable sheets 'and downloadable applications for cell phones, see their website: <http://www.sustainableseafood.org.au/>

Experience: On the same page as you found this lesson (link), under the heading Ray Lagoon ` you will find a link to the Elasmopage and a detailed 'Irukandji Shark and Ray Encounters Resource Guide' which contain relevant background information pertaining to marine species. The Irukandji Shark and Ray Encounters recommends pre-teaching relevant content as means of making your class visit a more meaningful learning experience.

## Irukandji Shark and Ray Encounters Worksheet

Name: Ray Lagoon Yellow Finned Bream	
Scientific Name: Kingdom: Phylum:	Phylum characteristics (list all you can think of):
Sketch and Label	Is this a sustainable seafood choice? Hypothesize and list the prey and predators associated with this species:
Tawny Terrain: Tropical Chondrichthyes	
Scientific Name: Kingdom: Phylum:	Phylum characteristics (list all you can think of):
Sketch and Label	Hypothesize how would a Tawny Nurse Shark would defend itself against predators: Have you ever eaten flake? Where does flake appear on the Australia's Sustainable Seafood Guide Online



<p><b>Aqua Nursery</b></p>	
<p>Scientific Name: Kingdom: Phylum:</p>	<p>How does algae function in the habitat? Can you see any other organisms interacting with the kelp? Describe your observations.</p>
<p>Algae is an important component of the food web. Explore this further and sketch the food web below. Label the parts of the <i>Ralfsia verrucosa</i>.</p>	
<p>How might the industry of <i>Ralfsia verrucosa</i> harvesting alter this food web balance (that you sketched)?</p>	
<p><b>Ray Lagoon - Elasmobranch</b></p>	
<p>Scientific Name: Kingdom: Phylum:</p>	<p>An estimated 25% of what is caught in commercial fisheries is unintended catch (bycatch) and discarded. Elasmobranchs are often caught in fishing nets as bycatch by commercial fisheries harvesting other species. A) Explain how this threat might influence Eastern Fiddler Rays in the wild. B) Record any evidence of this that you have observed with the Fiddlers at the Aquarium?</p>
<p>Hypothesize what species might be potential prey of the Eastern Fiddler Rays and justify your reasoning. Are any of these potential prey organisms on the Australia's Sustainable Seafood Guide Online? If so, what sustainability category are they in?</p>	

