Investigation Tasks

The Great Barrier Reef Marine Park Authority (GBRMPA) Year 11 and 12 Investigation Tasks may be used as either Extended Experimental Investigations or Extended Research Tasks to support the needs of students in science based units of work.

The Tasks include:

- **Marine Investigations**
  - Students conduct an experiment to investigate the impacts of different activities on the Great Barrier Reef.

- **Climate Change Report**
  - Students investigate and write a report on climate change using the *Great Barrier Reef Outlook Report 2009*.

- **The Great Barrier Reef Catchment Area Investigation**
  - Students gather data about their local catchment area to assess its health and its impacts on the Great Barrier Reef.

- **Natural Disaster Rehabilitation**
  - Students develop a public education program about how a chosen ecosystem will rehabilitate after a severe natural disaster.

- **Sustainable Fishing Methods**
  - Students design and conduct an experiment to investigate methods that will promote sustainable fishing in the Great Barrier Reef Marine Park.

- **Environmental Impact Assessment**
  - Students investigate the social, cultural, economic and environmental impacts that might occur from a potential new development within the Great Barrier Reef Marine Park and propose how to reduce impacts at an effective cost.
Year 11 and 12 – Investigation Tasks

Task - Marine Investigations

Choose one of the following topics as your marine investigation:

A. You are to design and conduct an experiment to investigate the impacts different types of anchors have on different substrates of the Great Barrier Reef. Consider the length of rode and angle of rode in your investigation. In your evaluation, identify any long term effects that may occur on the Great Barrier Reef due to anchor usage on certain substrates. (This task is not to be conducted on the Reef. It must be conducted in confined laboratory conditions.)

B. You are to design and conduct an experiment to investigate how building a marina in a chosen marine environment will impact different substrates in the Great Barrier Reef Marine Park. You could choose a real town along the Queensland Coast as the place for the marina or design a fictional town. You should consider the size of the marina and the population of boats using the marina. In your evaluation, identify any long term effects that may occur in the Marine Park due to the building of your marina.

What you will need:

- Form your hypothesis
- Design your experiment
- Conduct your experiment and collect data
- Write up your experiment analysing and evaluating your data.
You are to use the data presented in the Great Barrier Reef Outlook Report 2009, as well as other data you gather from various sources, to investigate and write a report on climate change.

Your report will focus on three areas:

- Climate Change
  - What is it?
  - How is climate change affecting the Great Barrier Reef?
- Future Predictions
  - Use researched data to present future predictions for biodiversity on the Great Barrier Reef.
- Management
  - Identify and analyse the effectiveness of current management strategies
  - Propose future individual and local management strategies to reduce the impact of climate change on the Great Barrier Reef
  - Justify your strategies.
Task - The Great Barrier Reef Catchment Area Investigation

You are to gather data about your local catchment area to assess its health and its impacts on the Great Barrier Reef. Your council will have water testing reports you can access. You should use the council reports as well as data collected from your own field research of your local catchment area. You are to use your collected data and analysis to write a report to educate the public about their local catchment area.

Your report should focus on the following areas:

- A summary of the health of the catchment area backed up by data
- The major factors affecting the health of the catchment area
- The flow-on effects of the catchment area to the Great Barrier Reef
- Management strategies to promote a healthy catchment area and to reduce any negative effects on both the catchment area and the Great Barrier Reef
- Your management strategies should consider economic, cultural, environmental and social implications.
Year 11 and 12 - Investigation Tasks (cont.)

**Task - Natural Disaster Rehabilitation**

You are to develop a public education program about how a chosen ecosystem will rehabilitate after a severe natural disaster. You will use a range of media strategies to develop your multimodal program including TV, newspapers or the web. You could use all of these media strategies or choose a combination of these and others you deem important for your public education program. How many media strategies you choose will depend on your chosen audience.

The following are some suggestions of scenarios of severe natural disasters:

a) A local offshore reef has been destroyed by a cyclone
b) A lake has dried up due to drought
c) A catchment area has been flooded due to high rainfall levels across the catchment area
d) A local forest habitat has been destroyed by bush fires
e) A beach area has been severely eroded by an unusually high storm surge
f) You could also create your own scenario.

Your public education program should focus on the following areas:

- Background information about the severe natural disaster and how it caused the damage
- Outline the damage done by the severe natural disaster and what the short term and long term effects are on the ecosystem
- What the rehabilitation process will involve including - will it be left entirely up to nature? Will there be any input from local council or environmental groups? What can locals do to help in the rehabilitation?
- Explain management strategies that could be put in place to prevent or control damage when future severe natural disasters occur.
**Task - Sustainable Fishing Methods**

You are to find a way to make fishing more sustainable. You will need to design and conduct an experiment to investigate methods that will promote more sustainable fishing in the Great Barrier Reef Marine Park.

**Choose from one of the following investigations:**

- Develop a new bycatch reduction device (an example of a successful bycatch reduction device is the Turtle Exclusion Device)
- Develop a catch and release cast net
- Develop a fishing method using lures or hooks to catch a specific target species (as identified by you).

**You will need to:**

- Form your hypothesis
- Design your experiment
- Conduct your experiment and collect data
- Write up your experiment analysing and evaluating your data
- Explain how your new device will influence the management of fishing in the Great Barrier Reef Marine Park.
Task - Environmental Impact Assessment

A new development is proposed to be built within the Great Barrier Reef Marine Park. As the project manager for the construction of the new development, you need to investigate the impacts that might occur during and after the development’s construction. You will need to propose how you will reduce those impacts at an effective cost. Focus on the social, cultural, economic and environmental impacts your new development may have.

Create your own scenario for the development.

The development could be a marina, resort, wharf or pontoon. Choose a local bay, harbour, beach or island within the Great Barrier Reef Marine Park for your development.