Lesson 7

ELABORATE

AUSTRALIAN MARINE DEBRIS INITIATIVE

Beach clean-up activity

There is no single solution to the plastic waste problem. One way to reduce marine debris and to activate students' understanding of being able to make a change is by doing a beach clean-up activity.

Orientation:

In this lesson, Ss take an excursion to the beach or river to collect samples of marine/river debris. Spend some time eliciting from Ss the types of rubbish they think they might find on the beach. Make a list of the top 10 items Ss think they will find. At the end of the clean-up when all the debris has been sorted, Ss can see if they were right. It is also good to spend a moment familiarising with the Marine Debris Identification Manual.

Community connection:

Prior to the beach clean-up, you may want to discuss with Ss who could come along to the beach clean-up from the greater community to help support the event, e.g. local ranger group, indigenous elders & community, city council, parents or some of the younger Ss from the local primary school. Ss could help create the invitation letters or make some of the phone calls. Having other members from the community at the event will increase Ss' interest levels.

YEAR LEVEL

Years 7 - 10

MATERIALS

Beach clean-up kit (bags, gloves, Marine Debris Identification Manual, data sheet, GPS equipment)

Sunscreen, hats, water, shoes

KEY WORDS

- Predict
- Observe
- Explain
- Transect
- Landforms
- Tide line
- GPS
- Extrapolated

Considerations:

Weather conditions before and during the excursion will play a part in how much debris is on the beach. A storm or a big tide will usually bring more debris onto the beach. It will be best to go to the beach around low tide as this is when most debris will be left behind www.bom.gov.au/oceanography/tides

Landforms: 'Is the beach flat or sloping?', 'Is the beach wide or narrow?' and 'Is there any evidence of erosion?'. Discuss these factors and how they may affect results of the beach clean-up.

Preparation:

Make sure you have all your equipment ready and that you have briefed Ss on all the safety requirements outlined by your school (such as sun safety), including what to do if Ss find sharps or containers containing liquids. Make a GPS record of the location you are going to collect the debris for later use on the data sheet.

For more information on how to run a beach cleanup, watch Tangaroa Blue's 'How to run a beach cleanup?' Follow the link: http://www.tangaroablue.org/resources/how-to-manual.html

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Procedure:

Measure out the area to be cleaned up and make a note so it can be written on the data sheet. Discuss with Ss different ways that areas can be measured out. Have Ss in pairs spread out along the beach and pick up all the marine debris they can find. Take note of anything unusual you see. You may even want to spend some time with Ss working out the longitude and latitude (GPS location) of your beach.

Micro plastics and plastic resin pellets:

These are most likely to be found right along the tide line and usually mixed up with seaweed. Remind Ss that these smaller pieces are very important to pick up and that if they find any plastic resin pellets that they can be sent away for analysis to find out what toxins they have absorbed. Place any plastic resin pellets found into a paper envelope.

A typical place to look for plastic resin pellets and micro plastics.

Micro debris requires different sampling methods:

Sampling methods include measuring particles per square metre, recording locations where they occur and recording hotspots.

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Transect sampling methods:

The data collection method used by Tangaroa Blue Foundation looks at the different types and amount of debris in a specified area. However, there are other methods of collecting data samples such as transects. Discuss with your Ss some different ways that data can be collected and in what circumstances you would use these types of data collection methods, e.g. if you were looking at a species of animal living in a habitat and didn't have time or resources to count all of them; or you might want to find an average of micro plastics that are in an area as sometimes, there can be too many to count.

Check for understanding:

Use the following statement from a James Cook University research student and ask Ss what sort of sampling method they think was used. Discuss reasons why.

> *"Based on my data it is reasonable to assume that the debris was evenly distributed through the waterways. Thus I extrapolated my findings of 0.61 items per metre of riverbank to estimate total river output to be approximately **33,200 items** possibly washed from the river into the coastal waters after the first big rain event, this equates to approximately **960kg** of debris.*
>
> *Kay Critchell 2012 – Research topic data*

Accuracy of data:

Have a discussion with Ss about what variables may affect the accuracy of data collection. Make a record of this information so that it can be discussed further after the data collection activity.

What to do with the debris after it is collected?

Keep the bags in a safe place so that they can be sorted and counted in the next lesson. If you are doing the sorting straight away, then refer to the phase in the next lesson called 'sorting it out'.

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