



# SCHOOLS FOR A HEALTHY ENVIRONMENT RESOURCES FROM THE ENVIRONMENT

Module 4



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## 3.2, 3.3 DECIDING DIRECTIONS AND FINDING OUT

The following activities will assist students to decide on the directions they wish to take in their research.

The following activities will also involve students in shared experiences that provide new information about the topic and stimulate curiosity.

### ACTIVITY 2: FIND OUT ABOUT OUR WASTE

**Purpose:** To decide on the waste process and to investigate the waste situation at school

**Time:** Initial sessions approx. 1 ½ hours, follow up sessions 20 minutes per day for a week

**Materials Required:** Weather, Water, Waste and Energy Flip Chart and Environment and Biodiversity Flip Chart

**Resource / Information Sheets:**

3.2 Student Resource Sheet –School Waste Audit Form

3.3 Teacher Information Sheet – How to conduct a waste audit

#### Procedure

Ask students to draw and describe the steps involved in the waste process from people first disposing of the waste to where they think the waste ends up? Share the ideas and decide on the most accurate.

Show students the Flip Chart pages on 'Waste Theory', from the Weather, Water, Waste and Energy Flip Chart and 'Bad Environmental Practices' page from Environment and Biodiversity Flip Chart. Discuss with students what they notice, what they feel about how the waste is being managed, how it is impacting on the environment. Ask students to think about their island's Waste management Centre. Explain that these are rapidly filling and this should be a real concern for the community.



*Students conducting a waste audit.*

Pose the challenge of reducing the amount of waste produced by the school through a waste management project. Ask students what they think they would need to do first in a project such as this?

Discuss with the class ways for finding out about the waste situation at school. What makes up our waste? How do we currently collect and dispose of waste?

Explain that the most accurate way to establish the current waste situation is to conduct a School Waste Audit. Write on the board or a chart the key characteristics of a School Waste Audit.

What is a School Waste Audit?

- It collects facts about the types of waste
- It is a way to look at the make-up of your systems waste disposal and reuse.
- It requires you to separate and weigh the different materials in these systems.
- It helps you to develop a more accurate waste management plan specific to your needs.
- It assists in making informed decisions when buying equipment such as recycling bins so you do not under/over estimate your needs.
- It helps you to estimate the costs/ benefits that will result from your waste management plan.

Organise students in to groups of four. Groups can take responsibility for conducting the audit on different days so that they all have a turn.

Provide students with a copy of *Student Resource Sheet 3.2*. As a class, practice filling in the form so that students are very familiar with what is required. You may use the example to practice with or you can make up some figures. If you feel that this is too complex for younger students to complete develop a simpler version.

This activity provides an excellent opportunity to investigate the volume of waste.

Students use the *Student Resource Sheet 3.2* to conduct a school waste audit over the time decided on by the class for example a week, a month. Teachers refer to *Teacher Information Sheet 3.3*

## 3.4 SORTING OUT

Students at this stage will be collating, processing, analyzing and presenting the information in a variety of ways. Students will have the opportunity to further explore any questions that may have arisen when they were investigating. This would also be a good time to revisit some of the initial activities from Tuning In or Deciding Directions sections, for the students to witness how their knowledge has increased.

### ACTIVITY 3: INTERPRETING THE DATA

**Purpose:** To collate data gathered from the waste audit conducted at school

**Time:** 1 ½ hours

**Materials Required:** Weather, Water, Waste and Energy Flip Chart, pens or pencils and student's exercise books

**Resource / Information Sheets:** 3.3 Student Resource Sheet –Waste Audit PMI (Plus, Minus, Interesting)

#### Procedure

At the end of the auditing period organise a method for collating all data collected by the students. The class may discuss and decide which is going to be the best way to do this, which could include tally sheets, tables or graphs.

Using a *Student Resource Sheet 3.3* students interpret the data. Discuss student responses as a class. Focus on common themes or ideas asking students to justify their ideas.

Invite students to make suggestions on the best way to represent the data to others, for instance drawing a map of the school with symbols, or annotated information, or a chart.

## 3.5 DRAWING CONCLUSIONS

The following activities will help students to interpret information, establish connections and confirm/reject or modify predictions.

### ACTIVITY 4: COMING UP WITH WASTE FACTS AND IDEAS

**Purpose:** To make decisions about waste facts and ideas for improving waste management at school.

**Time:** Approx. 1 ½ hours

**Materials Required:** A4 or A3 papers, markers and pens or pencils.

**Resource / Information Sheets:** 3.4 Student Resource Sheet –Waste audit brainstorm.

#### Procedure

Students will use *Student Resource Sheet 3.4* to consider the information from the waste audit including facts they have learnt and ideas for managing waste.

Create a class facts and ideas bank by asking students to contribute their top 3 facts and ideas.

As a class, discuss the ideas and tick those, which are considered a possibility for taking action.

Students design a waste information poster for the school using the facts from the audit and ideas for improving waste management at school.

# 3.2

## STUDENT RESOURCE SHEET SCHOOL WASTE AUDIT FORM

Fill in the table over a period of time. A separate form will need to be completed for each area.

School name:	
Season & Weather:	
Date: Time:	
Auditors:	
Bin location (circle)	School compound    classroom    office    other
No. and type of bins at location Size of bins	
Period of accumulation (e.g. 1 day)	

MANAGING WASTE

Waste Type	Approx. Volume/no.	% Waste Stream approx.	Responsible actions	Comments/Type
Paper				
Soiled paper				
Cardboard				
Aluminium cans				
Tetra packs (milk/juice cartons)				
Glass				
Plastics				
Polystyrene (ie. Coffee cups, packaging)				
Food (organic waste)				
Other- please specify				

## 3.2

# EXAMPLE OF COMPLETED STUDENT RESOURCE SHEET SCHOOL WASTE AUDIT FORM

Fill in the table over a period of time.

The aim of the audit is to determine the approximate percentage each stream of waste represents in the total waste produced and determine key areas for reduction/recycling. You may need to adapt this form, depending on the age of the students. Example:

School name:	Atoll Education Centre
Season & Weather:	Hulhagu Moosun- wet
Date: Time:	21 June 2006 3:00pm
Auditors:	Mohamed, Ali, Aminath, Mariyam
Bin location (circle)	School compound (classroom) office other
No. of bins in office Size of bins in office:	3 small waste bins, 2 litre kitchen bin 25 litres (most small bins are roughly this size)
Period of Accumulation:	Full day (cleaners empty bins first thing in the morning)

Waste Type	Approx. Volume/no.	% of Waste approx.	Responsible actions	Comments/Type
Paper	1. 60% of total vol of office bins 2. classroom bin 25% full	60%		15 litres x 15 bins = 225 litres of waste
Soiled paper	5 pieces of paper	2%	Compost	White paper soiled with food scraps
Cardboard	3 x packaging boxes	10%	Flatten	
Aluminium cans	1200mls	5%	Crush before disposing	4 x 400ml cans
Tetra pack (milk/juice cartons)	4 litres	10%	Crush before disposing	4 x 1 litre milk cartons
Glass	1 litre	5%		4 x 250ml bottle
Plastics	1800mls	6%	Crush before disposing	3 x 600ml
Polystyrene (ie. Coffee cups, packaging)	0	0		
Food (organic waste)	3 x apple cores $\frac{1}{2}$ sandwich	2%	compost	Use in school compost bin/heap. Keen gardener could take home for compost
Other	15 sweets wrappers			



# STUDENT RESOURCE SHEET

## WASTE AUDIT PMI

Use this PMI chart to record your thoughts about the waste audit data.

<b>Plus</b> What were the positive things?	<b>Minus</b> What were the negative things?	<b>Interesting</b> What things were interesting?

# 3.3

## EXAMPLE OF COMPLETED STUDENT RESOURCE SHEET WASTE AUDIT PMI

Use this PMI chart to record your thoughts about the waste audit data.

<b>Plus</b>	<b>Minus</b>	<b>Interesting</b>
<p>What were the positive things?</p>	<p>What were the negative things?</p>	<p>What things were interesting?</p>
<p>Before the audit I did not know how much waste we made. Now I see it is a lot.</p> <p>Also we went outside the classroom to do this activity. This was good.</p>	<p>The waste smelled bad. It was not very nice to be so close to the waste.</p>	<p>It was interesting to see the number of food packets and plastic bottles.</p>



## 3.2

# TEACHER INFORMATION SHEET

## WASTE MANAGEMENT IN THE MALDIVES

Solid waste management is now one of the most critical environmental issues in the Maldives. The amount and the rate of solid waste generated vary throughout the country and there is a significant difference between the amount of waste generated in Male' and that of the atolls.

According to the State of the Environment Report 2004, on average 1.1 kg of waste are generated per capita per day in Male' while in the atolls this value is between 0.70 - 0.79kg of waste per capita per day. Average waste generation in the resorts stands at 3.5 kg per guest per day. The amount of waste being generated is increasing at an alarming rate.

Presently, solid waste generated in Male' is collected and taken to a transfer station. From the transfer station, the waste is transported by barge to Thilafushi, a municipal landfill, located 5 km away from Male'. The Thilafushi landfill site has now become a landfill for the central region of the country. In addition to waste from Male', it now receives waste from islands in Male' atoll, the resorts and the Male' International Airport.

Solid wastes generated in the atolls are disposed using various methods. Organic wastes are composted at home backyards in most of the islands. Non-biodegradable waste such as plastics is dumped near the beach in many islands and buried in a few islands. Burning of combustible waste at designated areas in the islands is also widely practised in many islands.

Current waste disposal practices adversely affect the environment through habitat destruction and pollution. Often, wetland areas such as swamps and mangroves are considered as disposal areas and reclamation of such areas to increase land space often takes place. Dumping of solid waste near beaches also has adverse effects on the reefs and lagoons of the islands.

In 2008 the Ministry of Environment, Energy and Water has released a National Solid Waste Management Policy (refer to [www.erc.gov.mv](http://www.erc.gov.mv)). Some of the options of managing waste provided by the Environment Research Centre are as follows:

1. The biodegradable waste to be composted or burned.
2. Burning to be done safely.
3. Not to burn plastics and hazardous waste.
4. When burning biodegradable waste to leave it in the sun for a while for the moisture to evaporate before burning.

5. When burning waste to mount the waste on a platform so that it does not touch the ground and air can circulate in-between.
6. When the air circulates the burning pit would not emit black fuel instead it would emit gases which are not harmful to the health of living things.



*Barge with waste trucks leaving for Thilafushi*



*Burning waste*



*Waste on lagoon edge at Thilafushi.*

## 3.3

## TEACHER INFORMATION SHEET

### HOW TO CONDUCT A SCHOOL WASTE AUDIT

Your audit is intended to examine a representative sample of your waste collection system over an average school week. It will involve examining, identifying, sorting and recording the contents of the bins.

You will need to do separate audits for the waste bins in each of the following areas (because the composition usually varies):

- Classrooms
- Playground
- Office/Library

It is not necessary to sort and weigh the material from all bins in each area - but make sure that your sample is typical of the area as a whole.

Note on the audit form, the number of the bins sampled and the total bins in the area. Also note how many days it is since the bins were last emptied.

#### Preparation

There are a few things you must do before beginning your waste audit to ensure that it will be safely and effectively carried out:

- Obtain parent/guardian permission for any student involved in the waste audit.
- Make sure that you have the correct equipment for the job:
  - Thick gloves must be worn by anyone handling waste.
  - Safety glasses must be worn to ensure no foreign objects (i.e. glass) get into the eyes.

- Suitable shoes and clothing must be worn to ensure participants don't get cut by broken glass, etc.
- Long handled tongs to collect and handle the waste.
- Washing facilities with soap and towels for washing and drying hands during and at the end of the collection, sorting and disposal of waste.
- Tarpaulins or large sheets of plastic for tipping and sorting the waste.
- A rake to spread out the waste.
- Scales for weighing the waste.
- Clearly labelled bins or collection bags to separate materials in the audit.

#### Conducting the Audit

Using the School Waste Audit Form, make sure you have sufficient forms to cover each bin or area you will be collecting from.

Collect and sort the waste, allocating roles to each student (collecting, sorting and weighing of material and recording data). When sorting the waste students can also identify biodegradable and non-biodegradable waste.

Use the results obtained to develop a waste management program for your school.