Eco-Schools
Malawi

WASTE MANAGEMENT

Teacher's Guide
Upper Primary

CONTENTS

ACKNOWLEDGEMENTS

We would like to thank all partners who provided support in the development of these resources including the Ministry of Education, Science and Technology through the Department of Inspectorate, Department of Parks & Wildlife and the Environmental Affairs Department.

Development funding was provided by the Taiwan Forestry Bureau, the Tusk Trust and DANIDA through the Danish Outdoor Council.

Publisher: Lilongwe Wildlife Trust
First edition: 2013
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Photos overleaf from clockwise top left: rubbish piles up in a Lilongwe township; a woman wears jewellery made out of recycled paper; emissions from a factory's chimney; used bottles ready for recycling

"In the end we will conserve only what we love. We will love only what we understand. We will understand only what we are taught." Baba Dhiom

"All around the world we are seeing the negative impacts of our increasingly unsustainable living practices - deforestation leads to floods, droughts and crop failure; pollution causes loss of biodiversity and sicknesses like cancer. The importance of ensuring environmental sustainability is becoming more important every day, a challenge recognized as one of the eight Millennium Development Goals (MDG). Closer to home the Malawi Growth and Development Strategies also identified the need of incorporating environmental issues in the school curriculum.

EcoSchools Malawi does just this and is a vital step forward in giving our children the knowledge and skills to make a difference. Congratulations to all those partners who have managed to bring this worthwhile scheme to fruition. I hope that you, as teachers, take great pride in bringing it to life in your school and inspiring your learners to put these important concepts into action. I also hope to see your name on the list of those who receive an EcoSchool Award at the end of the year.

We all have a part to play in protecting our natural heritage for the benefit of both people and the environment, so let's work together to make our world a better place."

Signed,

Mr Leonard Sefu, Director, Department of Parks & Wildlife

HOW TO USE THIS GUIDE

Each teacher's guide has been written especially to help you lead your learners on a journey, to explore environmental issues, develop skills, encourage positive attitudes and empower children to take action. These materials are not meant to be prescriptive, rather we hope that you see these as **supplementary materials** to help you develop your own interactive lesson plans, adapting to the resources available and making the themes relevant to the lives of your learners.

When developing your lesson plans, you are encouraged to use the **IVAC approach** as we have done throughout this guide. IVAC is 'action-oriented teaching' which facilitates ***INVESTIGATION*** of the issues developing their ***VISIONS*** and taking ***ACTION*** to facilitate ***CHANGE***:

INVESTIGATION (I): Provide a learning platform that encourages children to investigate the topic at hand and discuss ideas together. Why is it important to us? How was it in former times? How has it changed?
VISION (V): What alternatives can we imagine? What is it like in other places? What do we prefer and why?
ACTION (A): Help children to formulate their own action plan on how to act on their knowledge. What actions bring us closer to our vision? What are the possible actions? What actions will we carry out?
CHANGE (C): Provide the means for learners to implement their desired action, make a positive change and monitor the benefits in their own lives as well as their schools and communities.

For each unit we have provided background reading to help you direct classroom investigation and supplemented this with suggested discussion topics and activities. Finally, we have made some micro-project suggestions that will help to translate their new found knowledge into action and change. You can also read more about EcoSchools accreditation scheme on the inside back cover of this guide. ***We wish you the best of luck!***

MODULE OVERVIEW

Key concepts	Waste, waste management, recycling.
Subject areas	Social and environmental studies.
Grades	Standards 5 to 8.
National Curriculum link	Students will learn how to take responsibility of their environment by managing their waste.
IB Curriculum link	What our environment is, our choices and their effects on the environment, choices that help the environment, we can do things to look after the environment.

~ LEARNING OBJECTIVES ~

Unit 1: The concept of waste
Learn about the definition of waste, the types and sources.

Unit 2: Waste Management
Learn about the definition of waste management and methods used, the way that waste is managed in Lilongwe and how to sort and weigh waste.

Unit 3: Impact of Poor Waste Management
Learn about the negative impacts of poor waste management from both a local and global perspective.

Unit 4: the 3 R's: Reduce, Reuse, Recycle
Learn about how to manage waste more effectively using the 3 Rs.

~ SUCCESS CRITERIA ~

For each unit we suggest that you develop a set of quiz questions for the class to assess their understanding of the topic. A sample of this is provided in the back of this guide. You can also set your own success criteria based on the activities you choose as part of your lesson.

~ DEFINING WASTE ~

Waste (also known as rubbish, trash, refuse, garbage, junk, and litter) is unwanted or useless materials. There many different forms and can be solid, liquid or gas.

The earth is a '**closed system**' – nothing disappears. In nature, the cycle of life operates in a circular system and waste generated by one organism becomes food for another. Fallen leaves decay and the nutrients are returned to the earth, to become food again for the tree. An exciting challenge facing city communities is to begin to imagine life without waste, where everything that is thrown away at the end of one life becomes the technical or organic nutrient for another life.

~ TYPES OF WASTE ~

There are two main **types of waste**:

GENERAL WASTE

Does not pose an immediate threat to people or the environment. Examples include household waste, builder's rubble and garden refuse.

HAZARDOUS WASTE

Can be any waste that may cause danger to health or the environment whether directly or when it comes into contact with other waste.

General waste can sometimes turn into hazardous waste through decomposition or infiltration by water it may produce 'leachate' (the liquid that oozes out of waste) which may have pollution potential and is likely to have hazardous properties.

~ SOURCES OF WASTE ~

- Domestic e.g. vegetable peelings
- Commercial e.g. packaging, plastic bags
- Industrial e.g. gases from factories
- Agricultural e.g. maize husks
- Clinical/biomedical e.g. blood, bandages
- Mineral e.g. stones from mining for precious stones
- Nuclear e.g. from power plants

...LET'S INVESTIGATE...

Ask learners to brainstorm where waste comes from in their local community. What about in other parts of Malawi?

...ACTIVITY TIME...

Ask learners to go out and safely collect different types of general waste and bring it into class (do not collect any hazardous waste). Then ask them to say where they think the different types of waste came from.

UNIT 2: WASTE MANAGEMENT

Waste management is the collection, transportation, processing, recycling, disposal, and monitoring of waste materials. We all produce waste and all have a part to play in waste management .

~ METHODS OF WASTE MANAGEMENT ~

Waste management differs between countries and between urban and rural areas. Government often takes some responsibility for waste management especially in cities. Here are some of the main methods of managing waste:

- **LANDFILL:** Burying waste is a common practice in most countries. A well-managed landfill can be a hygienic and quite cheap method of disposing of waste materials. However poorly designed landfills cause many adverse environmental impacts e.g. attraction of vermin. Another common product of landfills is gas (mostly composed of methane and carbon dioxide), which is produced as organic waste breaks down without oxygen. This gas smells unpleasant, kills surface vegetation and is a greenhouse gas which can cause global warming and therefore climate change (see climate change module).
- **INCINERATION:** Burning materials reduces the volume of solid waste. Incineration is a controversial method of waste disposal, due to issues such as emission of gaseous pollutants.
- **RECYCLING:** Some waste materials can be recycled into new products. This waste can be separated out and taken to a recycling factory for processing. Recycling of materials like plastic, aluminium and glass on a large scale is common in many countries but not well developed in Malawi. There is a plastic recycling factory in Blantyre.
- **ENERGY RECOVERY:** The energy content of waste products can be harnessed directly by using them as a direct combustion fuel, or indirectly by processing them into another type of fuel. An example of this in Malawi is the use of fuel briquettes made out of waste materials like paper.

Integrated waste management reduces the need for new raw materials and so helps prevent environmentally harmful processes such as mining, power generation and water exploitation. Less waste means less pollution, and reducing waste can save money. Waste can be minimized by reducing what we consume, re-using items several times, recycling those things that cannot be reused, and recovering energy from waste that is burnt or that rots.

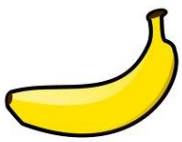
...LET'S INVESTIGATE...

Ask learners how they manage their waste at home. Take note of any recycling efforts and any efforts to reduce waste at home. Where do they think all their rubbish goes after they get rid of it? What examples of waste do they think lasts the longest or is hard to break down?

~ HOW LONG DOES WASTE TAKE TO BREAK DOWN? ~

Waste breaks down eventually, but some takes a lot longer than others.
Here are some examples of waste products and how long they take to break down ...

BANANA



2 months

NEWSPAPER

6 months

CIGARETTE

12 years

PLASTIC BAG

400 years

STYROFOAM PACKAGING

5000 years!

~ WASTE MANAGEMENT IN LILONGWE ~

Lilongwe City Council is responsible for waste management in the city. Lilongwe Water Board is set to take over responsibility for liquid waste management in the city. The sewerage system in Lilongwe covers only 9% of the city. The majority of Lilongwe's residents, especially those in the informal settlements, rely on pit latrines for human waste disposal. Waste management services are readily available in the high income areas but the low income areas do not have access to these services.

Commercial areas such as markets have their waste collected, albeit irregularly. The landfill in Lilongwe's Area 38/2 is estimated to receive about 20,754 tonnes of solid waste per month. Urgent attention and new ways need to be found to address waste collection and management. It is vital to involve all sectors in waste management because the city council does not have sufficient capacity to collect and dispose off all the waste produced in the city.

Most households, especially in the informal settlements, dispose their waste in open spaces, on riverbanks and along roadsides. Uncollected refuse is a common site in Lilongwe's markets and a major cause of environmental degradation. Management of the only dump site in Lilongwe's Area 38/2 is poor. A few local development organizations have come forward to assist in improving sanitation in the city through the promotion of ecological sanitation (eco-san) toilets that encourage use of human excreta and urine as organic manure.

...ACTIVITY TIME...

This activity can help learners explore more about waste management around them.

- Split learners into groups and ask them to go and safely collect some rubbish. Ask them to weigh their waste. (If you don't have scales perhaps you can find a way to make a comparison with something you do know the weight of).
- Ask learners to try and identify where that waste might have come from.
- Work out how much this waste would weigh if:
  - you included every person's waste in the classroom
  - it was waste accumulated over the whole year
  - it included everybody's waste in Malawi over a year.
- Separate out waste that can be composted, recycled or reused and re-weigh the remaining waste.
- Work out the difference in weight between throwing all your 'rubbish' away, compared to composting, recycling and reusing what you can.

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~ LOCAL STORY: A CHILD FROM CHILOWA VILLAGE... ~

In Chilowa Village, there is a market with a garbage collector where villagers and business people throw their wastes. However not everyone uses it and there is often rubbish left lying around.

One day some children accidentally broke a Fanta glass bottle but they didn't' want to be delayed from playing in the river so they left it behind and went off to meet their friends.

Later that day, some other children started playing football on the same ground. Soon one boy had trod on the broken glass and cut his foot. He picked up the shard of glass that had hurt him, he went home and the others carried on playing. Five minutes later another boy trod on more glass and soon the remaining children noticed that the ball had deflated and there were small pieces of glass on it. As a result they had to stop playing. They did not remove the glass. Next day a goat came looking for food nearby and ate some of the glass by accident. The goat got sick and died. The owner had been relying on selling the goat to pay for his child's school fees.

...LET'S INVESTIGATE...

After reading the story to the class, ask them the following questions:

- What is the story about?
- How could this situation have been avoided?
- What other examples do you have where you or a friend has suffered because of something similar?

~ NEGATIVE IMPACTS ~

There are many negative impacts associated with poor waste management - affecting people, wildlife and the environment. Here are just a few examples:

HUMAN DISEASE: Improper management of sewage which can get into water cause diseases like dysentery and cholera. Atmospheric pollution like smog from cars and factories can cause cancer. Even broken bottles left lying around can collect stagnant water and become a breeding ground for mosquitoes, leading to the spread of malaria.

INJURY & DEATH TO WILDLIFE: Fish can die from chemicals that have been washed into the river. Birds that eat the poisoned fish can also die. Or if all the fish die and there is no fish for the birds to eat, the birds will die from starvation. Animals may try to eat waste like plastic bags and can suffocate and die. If this happens to someone's domestic animal, like a cow, then this will also lead to a loss of income.

CROP FAILURE: Gases released into the atmosphere - like methane from rotting waste, smoke from fires or gases from factories - can lead to **acid rain** which can destroy crops and the fertility of soil. Dumping waste in the wrong place can also cause blockages where water should drain, which can lead to floods which can damage crops.

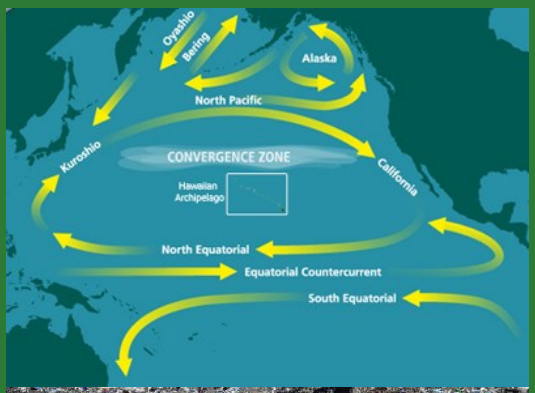
CLIMATE CHANGE: Atmospheric pollution is linked to changes in climate. The gases mentioned above can also lead to a change in weather patterns, which in turn can affect crops as well as extreme weather patterns like tornadoes and hurricanes that can destroy houses. (See climate change module for more information.)

LOSS OF INCOME & UNPLEASANT PLACES TO LIVE: Poor waste management makes the environment look ugly. This is unpleasant for the people who live nearby and will also discourage people from visiting, including tourists who would bring money to the local community.

~ GLOBAL PERSPECTIVE: THE GREAT PACIFIC GARBAGE DUMP ~

In the middle of the Pacific Ocean between the Americas and Europe there is a giant collection of rubbish, officially the largest 'landfill' in the world. It includes all sorts of rubbish from broken chairs to plastic bottles, oil residue from ships, basically anything that has been washed into the sea and has become stuck in this huge swirling mass thanks to the ocean's currents. Much of the garbage is underwater, so the photo shown here is an extreme example.

Negative impacts include injury and death to wildlife like fish and birds through direct injuries and pollution of the sea from the degradation of plastics which can kill wildlife and damage the delicate ocean eco - systems. The toxic waste can also pose a danger to humans and fish that has lived in toxic waters should not be eaten.



DID YOU KNOW…

- Estimates are that the floating dump covers the area the size of the USA, which is 80 times bigger than Malawi.
- Plastic constitutes 90% of all trash floating in the world's oceans.
- Every square kilometer has roughly 120,000 pieces of floating plastic.
- It is estimated that over a million sea birds and one hundred thousand marine mammals and sea turtles are killed every year from ingestion of, or entanglement in, rubbish.

…ACTIVITY TIME…

Split the learners into four groups and give each group one of the following scenarios.

- A raw sewage pipe is broken by some construction workers repairing a road next to a river.
- A factory illegally dumps its chemical waste on the edge of a village near crops.
- People in a township keep their own houses clean but drop rubbish on the streets.
- A boy's mother asks him to burn some rubbish from the garden. He starts a fire to burn it and then he goes out to play with his friends. The fire catches to some nearby trees….

Ask them to spent 15 minutes to come up with a short role play (5 minutes) around each scenario in front of the class, showing the negative behaviour and the consequences that impact the people, wildlife and the environment.

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UNIT 4: REDUCE, RE-USE, RECYCLE

The three rules of waste management are:

REDUCE -> Reducing the number of things you buy and throw away

RE-USE -> Reusing things many times before discarding them

RECYCLE -> Making new things out of old ones

Here are some ideas about how these rules can be put into practice. Depending on your location and resources, some points will be more practical and relevant than others.

~ REDUCE ~

- Shop carefully: Buy in bulk to reduce the amount of packaging required; choose returnable, reusable or recyclable containers.
- Avoid over-packaged products and unnecessarily packaged food
- Choose durable articles that will last a long time.
- Buy products with a recycled content.
- Use rechargeable batteries where possible, cloth dishtowels and napkins instead of paper ones, and refillable ink pens. Avoid disposable plates, cups and cutlery.
- Take your own basket, or re-useable plastic bags, to the supermarket to avoid using ne plastic shopping bags each time.
- In the office and at school, photocopy both sides of the paper.
- Think before you buy – do you really need that item?

~ REUSE ~

- Glass and plastic bottles with deposits can be returned to shops for reuse.
- Wash and dry plastic bags for reuse.
- Reuse paper that has only been printed on one side. Staple together paper that has been written on one side only for scrap paper.
- Nursery schools make good use of the inside core of toilet rolls and paper towels, egg boxes, cereal boxes and jam jars.
- Charities welcome unwanted clothes, furniture, toys, books and magazines. Offer electrical devices in working condition to charities or schools before disposing of them.
- Repair things rather than throw them away.

~ RECYCLE ~

- If products cannot be reused then recycle them. The first step is to separate your waste at home/school into organic waste, plastic, glass, cans and paper - all of which can be recycled for reuse.
- Glass and cans are 100% recyclable. Contact Lilongwe Wildlife Centre or the City Council to find out what recycling programmes operate in your area.
- A compost heap is a must! Kitchen and garden waste can be added to the compost heap, or used to feed pets or garden birds.
- Used motor-oil is recycled by people who operate a maize mill and can be dropped off for free at most reputable vehicle service stations.
- Find out about fuel briquette projects that might want your paper waste.

...LET'S INVESTIGATE...

After reading the story to the class, ask them the following questions:

- Introduce the learners to the Three R's—Reduce, Re-use, Recycle
- Split the class into 3 groups and assign them each to 1 to the 3 R's.
- Ask them to spend 10 minutes coming up with ways they can achieve their goal. You may want to help with some suggestions by spending a couple of minutes with each group.
- The group nominates one person who will present their ideas to the class.

AN ECO SCHOOL CASE STUDY

Lessons from putting waste management into practice

As part of the Eco Schools programme a teacher gave a lesson on waste. Following this her class decided that they would like put their learnings into action and make a difference in the community so they started a recycling project. The rest of the school was enthusiastic and they raised money to make a shelter for a waste collecting site. By the end of the first year, a waste recycling centre had been developed and useful waste was being brought to the school for recycling. The school was awarded an Eco-School green flag due to the success of this initiative. Everyone was proud of what had been achieved.

The project started gaining momentum and the waste kept on arriving from enthusiastic parents and children. However, the centre started to become a dumping ground as people brought more and more waste paper, aluminium cans, bottles and plastic for sorting and recycling. At one point a wind storm blew the waste that had not yet been sorted out of the school grounds and into the town. The project was beginning to defeat its purpose as it seemd that everyone had simply learnt to bring their rubbish to school rather than make better choices that would reduce the amount of rubbish they collected and had to dump. If people were more careful about the amount of waste they produced, recycling would not be as necessary.

Another issue to consider was energy consumption and thus global warming. Was it viable to increase carbon emissions through transporting recyclable waste to centres that were far away? For example, the nearest paper mill that added recycled paper into its production process was a thousand miles away. Exploring this question helped the group to understand why the local waste company stopped collecting as petrol costs increased and also why they were only interested in recycling high quality paper. Next to fail was the plastic recycling as the company only wanted certain products and not everything.

As doubts and collection problems developed, the class decided to undertake a life cycle audit of the four main types of waste being brought to the school: plastic, paper, metal and glass. Each of the four groups investigated the life cycle of the waste to find out how viable it was to recycle. What waste would bring in the most money? What waste recycling would benefit the environment most? What was easiest to recycle locally? How much waste would be needed for collection to be worthwhile? What was actually being done with the recyclable material?

The class found out that recycling aluminium cans brought in the most money. However, they also learned that recycling aluminium to make new cans has a high impact on global warming because of all of the electricity used. The group researching plastic found out it is difficult to recycle if a product contains many different types of plastic. However, the clear plastic found in coke bottles, for example, is easy to make into a grey cloth that can be used for drainage & habitat restoration.

After further investigation the Eco-School team realised that a new waste management strategy was needed. Recycling was becoming the sole driver and the original project to manage waste better was not leading to waste reduction. People were not buying less and making choices of packaging and products where waste could be re-used in practical ways. With creative thought, 'a lot of stuff' doesn't have to be treated as waste at all. Creative re-use can save money and the overall amount of waste can be reduced as less 'stuff' is bought from the shops.

Based on their new thinking the class decided to make note pads to re-use paper that had only been used on one side. Their creative slogan 're-use one-sided paper' helps to remind us to make better use of quality waste paper before recycling it. They decided to continue recycling aluminium cans, glass and the clear plastic from cool drink bottles but also to try to reduce their use of these. One child's mother made lemon juice so she agreed to reuse some of the screw-cap bottles dumped at the recycling centre. They wrote a letter asking parents to please bring in only these four items: one-sided paper, aluminium cans, glass bottles and cool drink bottles.

The most important thing the learners learnt from this project was that reducing waste comes before recycling. This change in thinking allowed them to explore the 'zero waste initiative'. The school now operates a much more efficient recycling depot and learners aim to 'reduce before recycling'.

LEARNING FROM ACTION

Here we have suggested some additional practical waste management activities that you may want to adapt depending on your resources. You are encouraged to relate your activities back to the learnings in this and other Eco Schools modules and how action can make a positive difference in relation to the lives of individuals and the community as a whole.

1. WASTE TO WONDER

So much waste can be re-used and an art and craft 'waste workshop' is a fun way to help learners get creative. Perhaps the class can have a competition about who can create the most exciting gift or piece of art out of waste? Here are examples of items which are currently made in Malawi by local community groups and are sold in gift shops like at Lilongwe Wildlife Centre:

Jewellery: Old bottle caps can be made into earrings or necklaces. Magazines and coloured newspaper can be rolled up to make pretty necklaces or bracelets, or perhaps decorating picture frames.
Bags and wallets: cut plastic bags into strips, twist them and tie them together to make one long piece. Weave or crochet to make a strong bag. This method can also be used to make hair ties and bracelets. Old packaging and brightly coloured labels can be sewn together. Old pieces of chitenje can also be sewn together to make items like this.
Note paper: old paper can be mulched into a paste and put together as books - see activity 3 for how this is done.
Glasses & candle holders: old glass wine or beer bottles can be cut in half to make glasses or candle holders.
Metal sculptures: old scrap metal can be bent or melted to make pieces of art.
Papier mache bowls: all you need is another bowl, newspaper, flour, water, glue and a piece of plastic. 1. To make the paste, boil 1 part flour with 5 parts water until a glue-like consistency is formed. Leave the paste to cool down until lukewarm. 2. Tear, don't cut, the newspaper into strips. 3. Cover the bowl with the plastic piece. 4. Dip the strips of newspaper into the paste, making sure they are completely covered. Then cover the outside of the bowl with the strips. Do about four layers. 5. Leave to dry for about five hours, and then remove the bowl. Leave until completely dry.

2. MAKE YOUR OWN RECYCLED PAPER

Recycling paper is simply a process of turning waste paper back into pulp. The pulp is then recaptured on a gauze to once again become a sheet of paper. Pulp is made with warm water and postage stamp sized pieces of paper. After soaking to soften, it is shredded up into pulp with a hand food-mixer or egg beater.

- Tear the paper into postage stamp pieces and soak them in warm water for 3-4 hours then beat the pulp until a creamy pulp.
- Make up the paper making frame by sandwiching gauze (mesh) between two wooden frames that are slightly larger than the size of paper you want to make.
- Mix the pulp with warm water in a large basin.
- Hold the frame firmly with the gauze uppermost. Insert the frame at a steep angle into the basin with the pulp; hold it in the basin at a level so that the gauze is filled with pulp; then slowly lift out of the basin.
- Drain the water while holding the frame level.
- Lift off the top frame. Using both hands lift up one end of the gauze. Place the paper on a drying board – masonite, Formica and Perspex are best. Sponge out the water. Lift off the gauze. Dry in the sun or overnight.

3. MAKE YOUR OWN COMPOST

HOW A COMPOST PILE WORKS

Composting uses nature's own recycling system. When leaves drop from a tree, they decay into soft black humus over time, without any help from people. Anything that once lived will eventually decompose. Composting is based on this natural process and begins with the thousands of micro-organisms which live naturally in soil. They feed on a moist heap of organic waste materials, generating considerable heat in the process. Other groups of "decomposer" organisms go to work as the temperature rises, an ever-changing workforce of bacteria, fungi, and insects. When the temperature drops, turning or stirring the pile gives the decomposers more oxygen and the heat builds again, helping to kill harmful bacteria. When all the easily decomposed material has been consumed, the temperature drops for the last time and earthworms and ants may move in, signalling that the compost is ready to feed new plants with its "recycled" nutrients. Finished compost has the distinctive fresh smell of newly-turned soil and won't heat up again no matter how often you turn air into the pile. The ideal result of the composting process is crumbly, dark, soil-like humus.

BENEFITS OF COMPOST

- **Reducing garbage**: Up to 30% of the garbage we throw out each week can go in the compost pile. Cutting domestic waste generation means a longer life for landfill sites and better environmental management for the entire community.
- **Helping plants grow**: Your garden and house plants can never get too much compost. It gradually releases a variety of nutrients just when they're required by the growing plants. Insects and diseases don't seem to do as much damage where the soil is enriched with plenty of decayed organic matter.
- **Building up the soil**: Plenty of compost added to the soil will act like a sponge, soaking up water when it rains and releasing it in dry spells. It improves the structure of both sand and clay soils, protecting them against drought and erosion.

WHAT WASTE CAN BE USED

Some materials contain high amounts of carbon in the form of cellulose which the bacteria need for their energy (brown materials). Other materials contain nitrogen in the form of protein, which provide nutrients for the energy exchanges (green materials).

- Suitable brown materials with a high carbon content include dry, straw-type material, such as cereal straws, autumn leaves, sawdust and wood chips, paper and cardboard.
- Green materials with relatively high nitrogen content include green plant material (fresh or wilted) such as crop residues, hay, grass clippings, weeds, manure of poultry and herbivorous animals such as goats and cows, fruit and vegetable peelings.
- Unsuitable materials include items like glass, plastics and paper cartons with plastic coating.

HOW TO MAKE YOUR OWN COMPOST

Start with a layer of sticks for drainage, followed with layers of grass, leaves, manure, and soil, alternating brown and green materials. Chop up big leaves. Add a final layer of soil, make a hole in the middle to let air in, water the heap and cover with grass or with a cloth to keep it damp. After about five days the heap will heat up as bacteria work to break it down. Keep the compost damp. After about six weeks, turn the compost, and then every few weeks. After three months, test it. If it is dark, crumbly, light and moist, it is ready to use.

Note that this activity can be linked with lessons on the food chain in the biodiversity module.

LEARNING FROM ACTION

4. LINKING WASTE MANAGEMENT WITH YOUR MICRO PROJECT

As part of your work towards Eco Schools accreditation, you are recommended to undertake a micro-project that helps children to learn through action and see the impact of the change they have implemented.

One such example is the 'Green & Clean' micro-project which tackles a number of issues brought up in both this and other modules. Elements include:

- Afforestation: learners plant 1-2000 trees in a woodlot which they manage
- Fuel briquettes: learners work with the local fuel briquette cooperative to learn how to make and use briquettes.
- Use of eco stoves: these stoves help to reduce fuelwood usage and were also used with fuel briquettes
- Community clean up: learners take responsibility for picking up litter and set a good example to other community members.

This helps children to learn about waste and waste management, deforestation, restoration and protection of habitats for the benefit of people and wildlife as well as how income can be generated from sustainable livelihoods projects.

You can find out more how about how to run a similar project in your school in the micro-project supplement which is supplied as part of this series. If you would like further advice please email education@llwc.org, call 0211 951819 or write to Lilongwe Wildlife Trust, PO Box 2140, Lilongwe.

FINALLY....SOME FASCINATING FACTS

- If all household paper and cardboard was recycled, ¾million m3 of landfill space would be saved each year.
- The United States makes up only 4% of the world's population, yet it is the number one producer of garbage
- Bones were one of the most recycled items before the twentieth century. Bones were often used for making buttons and gelatin, which was used in food processing, photography, and glue and paper making.
- Each year, Americans throw out enough soda pop cans bottles to reach to the moon and back—twenty times
- As much as 50% of waste from the average household could be composted.
- Up to 80% of a vehicle can be recycled.
- 1 recycled plastic bottle would save enough energy to power a 60-watt light bulb for 3 hours.
- Recycled paper produces 73% less air pollution than if it was made from raw materials.

MORE ON ECO SCHOOLS MALAWI

HISTORY

Eco-Schools is an international award programme introduced by the Foundation for Environmental Education that operates in more than 46 countries around the world including South Africa and the UK. Set up in 1994, the purpose was to involve young people in finding solutions to environmental and sustainable development challenges at the local level. The programme encourages whole-school improvement through positive environmental change and curriculum-based learning. Teachers, learners, community members and various partner organisations can work together and are given the opportunity to improve the environment of the school and also that of the community.

ECO-SCHOOLS MALAWI

The Eco-Schools programme was adapted for Malawi and launched here in 2012. Through this programme learners will increase their awareness and understanding of key environmental issues and will be encouraged to develop a passion for and ownership of their country's natural heritage. This is achieved through participation in classes and workshops on key environmental themes as well as practical micro-projects that help students to learn through action. Schools are encouraged to explore the following themes, for which these teacher's guides provide a framework:

- Wildlife welfare & conservation
- Nature & biodiversity
- Forests & deforestation
- Water
- Soil & sustainable agriculture
- Waste management
- Climate change
- The environment & human health

These topics are linked closely to those of both the IB & National Curriculums, so enhancing overall learning for those pupils involved.

BENEFITS OF JOINING ECO-SCHOOLS MALAWI

- Enhances the curriculum: Eco-Schools provides great ways of introducing environmental topics linking in with the National Curriculum and, in doing so, it helps to develop a creative learning environment for all pupils involved.
- Links to the community: The Eco-Schools programme is designed to involve as many people as possible, both inside and outside school, to raise their awareness of environmental issues and to improve the community spirit of an area, helping everyone to become involved in the decision-making of their local area.
- Improves school environment: Students are encouraged to take responsibility for their environment around them, and you are likely to see the results in many ways, from less litter through to tree planting and vegetable gardens as part of the micro-projects.
- Recognition & publicity: Schools are assessed on a number of criteria each year and they can work towards bronze, silver and gold accreditation. Gaining this accreditation is an important achievement which will undoubtedly attract attention within the school and in the wider community.

WHO CAN JOIN?

The scheme is initially being introduced in a select number of schools in Lilongwe and Salima who will work closely with the key Eco-School partner organisations, WESM & Lilongwe Wildlife Trust, with a view to roll out the programme nationwide in 2014/15. However any school can apply to join the scheme. The programme will be run by a select eco-committee within the school which we recommend should include around 30 learners, a teacher and at least one other community member representative. There are also opportunities for whole school involvement through activities like assembly presentations.

HOW TO FIND OUT MORE

This series of teacher's guides are supplemented with a handbook which provides more details how the scheme works. You can also contact education@llwc.org for more information.

Eco-Schools Malawi

BROUGHT TO YOU BY

Lilongwe Wildlife Trust

MALAWI PARKS AND WILDLIFE

Wildlife & Environmental Society of Malawi

LILONGWE BRANCH