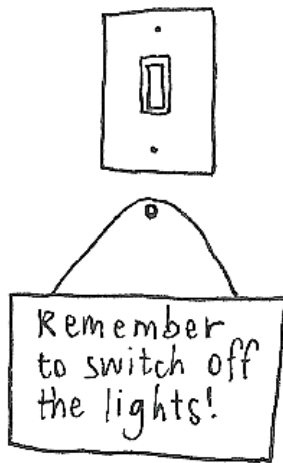


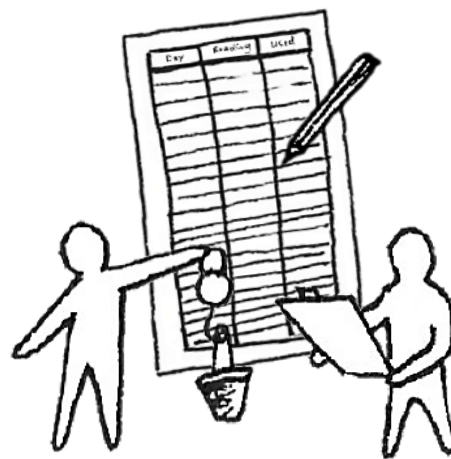


TEACH for ESD

REDUCE RESOURCE USE



Resource Conservation
Education



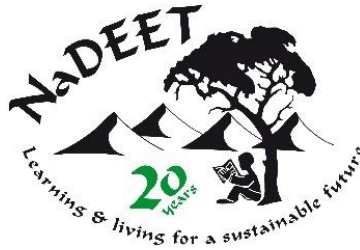
Environmental
Auditing



Resource-efficient
Schools

Teach for ESD - Toolkit Guide 3.6

REDUCE RESOURCE USE



Published in 2024 by the Namib Desert Environmental Education Trust (NaDEET).

Authors: Viktoria Keding and Alisa Volkmann
with contributions from NaDEET staff

Illustrations & Design: Alisa Volkmann

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Brot
für die Welt

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OVERVIEW

Reducing the use of resources at schools and in our daily lives is one of the environmental actions that we can take which gives an immediate result. Our school operations all rely on some form of energy and water and produce waste. By reducing our resource consumption and producing less waste, we will protect our natural resources, reduce our carbon emissions, *and* save money.

The first step in reducing resources is to understand the origin and value of resources – this can be done through **resource conservation education**. We can raise awareness through our lessons, education campaigns, as well as, through “green nudges”. Through **environmental auditing**, we can measure and track our resource use over time. This audit can then inform a resource management plan accordingly. By maintaining or improving our school infrastructure and “greening” school programmes (e.g. the national school feeding programme) and daily activities, such as commuting to school, we can become a **resource-efficient school**. These activities are on-going. Once ideal resource use is achieved, ensuring proper management and maintenance needs to be planned on a continuous basis.

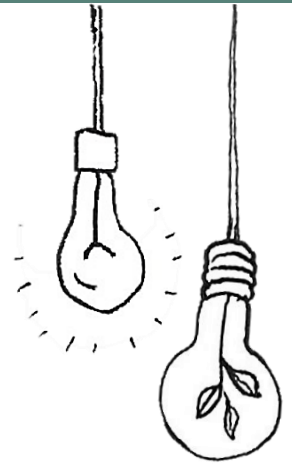
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1. RESOURCE CONSERVATION EDUCATION

AWARENESS

Many people are just not aware of the impact that wasting energy, water and other resources has on the environment. We often take for granted and assume that there will always be enough of things like water or firewood; however, this is not the case. Our **natural resources** are limited. With increased use per person and more people in Namibia, we must become aware and change our attitudes.



AWARENESS

Concern about and well-informed interest in a particular topic or situation.

We can begin by teaching our learners about the many different aspects around energy, water, and waste as discussed in **Toolkit 1 – Environmental Knowledge**. This can be integrated throughout subjects to develop a solid understanding of our natural resources. It is important for our learners to first understand *where* our natural resources come from. Then they need to understand how these raw natural materials are processed, manufactured, managed, and delivered to us, the consumers. We can begin with a general overview on natural resources and then explore the three topics in more depth.

RESOURCE CHECK For primary school learners, watch the **Environmental Learning** videos from *Giraffe Conservation Foundation (GCF)* about **Energy, Water Management** and **Waste and Litter Management**.

RESOURCE CHECK For younger learners, use the **It's Time to Grow** activity booklets in **Toolkit 3.1**. For secondary school learners use the many resources in **Toolkit 1**.




To develop an understanding and an interest in protecting our natural resources, we can focus our education on the conservation of these limited resources and the minimization of waste.



ENERGY CONSERVATION

Using less energy by adjusting our behaviours, habits and purchases



WATER CONSERVATION

Adapting our behaviour and habits to reduce unnecessary water usage



2

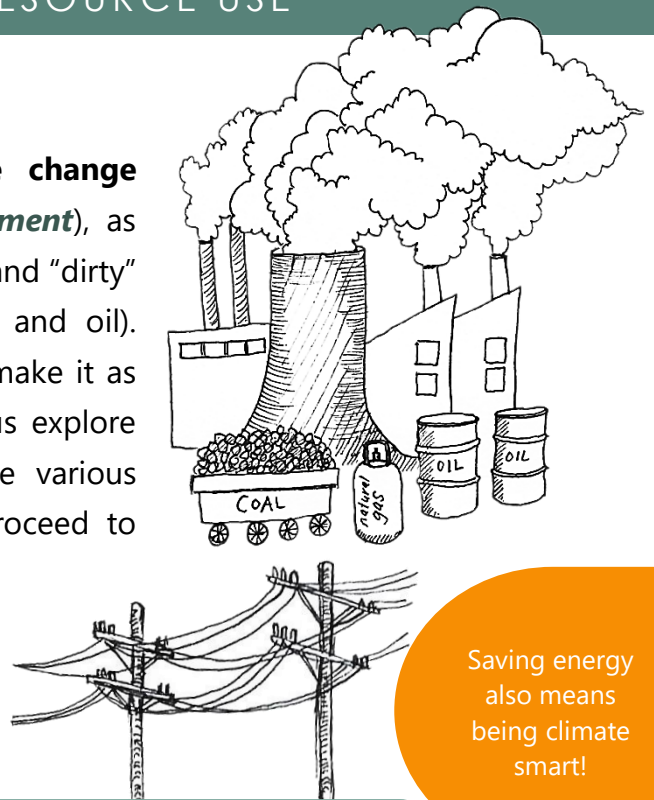
WASTE PREVENTION

Creating less waste through changing behaviours and habits



ENERGY CONSERVATION

Energy conservation is an important part of **climate change education** (see *Toolkit 3.1 – Teach about the Environment*), as global warming is a result of humans using non-renewable and “dirty” energy resources: burning fossil-fuels (coal, natural gas, and oil). Energy is a topic that is taught in many subjects - let us make it as interesting and relevant to our learners as possible! Let us explore **renewable** and **non-renewable** energy sources and the various activities that humans need energy for. We can then proceed to looking at how we use energy at our schools and look at how to conserve energy. Many of the resources on energy in *Toolkit 1- Environmental Knowledge* can be used to teach learners at various phase levels about this topic.



Saving energy also means being climate smart!

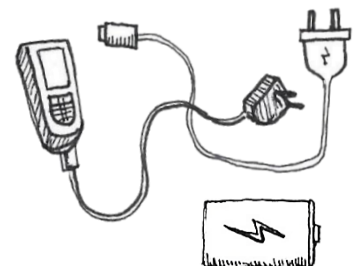


With your secondary learners, watch the video by *Think Namibia* on **Conserving Energy** and read the factsheets on **Renewable Energy** and **Conserving Energy**.

In our schools we mainly use energy for lights, computer equipment, the staff kitchen, our school feeding programme, and in some schools, the hostel.



Depending on how well-resourced schools are, their energy sources (i.e. electricity, gas, paraffin, firewood, solar) and how they are used varies widely between schools and regions.

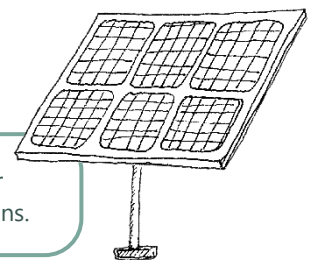


We can teach about energy aligned to SDG7, with a focus on the issues of:

- ACCESS
- EFFICIENCY
- RENEWABLE



Use the **Bush Telegraph: Sustainable Energy** with senior primary learners to investigate what sustainable energy means.



“In regard to environmental value, REEE-powering (renewable energy, energy storage and energy efficient technologies) is expected to reduce local and regional greenhouse gas emissions, lessen the environmental footprint from the use of fossil fuels, and save water in the electricity sector.”

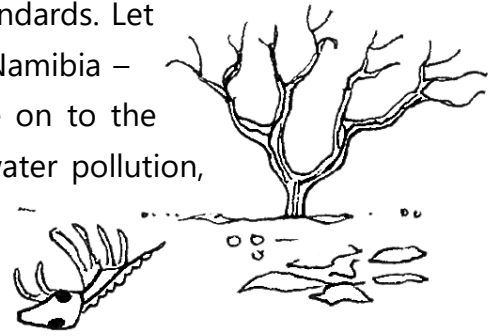
VON OERTZEN, 2015

WATER CONSERVATION

Water is one of Namibia's most limiting factors to development.

Namibia is a dry country that is prone to long periods of drought. As we have learned in *Toolkit 1 – Environmental Knowledge*, this will only continue to get worse through the impacts of climate change. With the recent COVID-19 pandemic, there is already an increased awareness about the necessity for access to clean water in schools to maintain hygiene standards. Let

us start by exploring our different water resources in Namibia – which includes learning about the water cycle! Then we can move on to the threats to our precious water resources, such as climate change, water pollution, water wasting etc. Finally, we can then explore solutions and ways to save and protect our water resources.



Use the teacher manual *Caring for our Water* to raise awareness about Namibia's water situation and the importance of conservation.



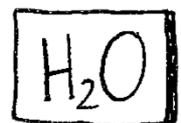
See the *Blue Gold* water-focused lesson resources from *Global Ideas* which include some great ideas, educator materials and information.



Use the *Bush Telegraph: Water is Life* from *Toolkit 3.1* to teach senior primary learners about the importance of water.



Use the comic *The Incredible Adventures of H₂O and his friends* to teach about the different sources of water in Namibia, with older learners.



Use the *Think Namibia* factsheets *Saving Water*, *Water Pollution* and *Water Innovations*, and the poster *Innovative Approaches to Address Water Insecurity* with your secondary school learners.

We are all responsible to take care of our precious water resources. We have the opportunity to teach about water in many different subjects as it is the basis for life and our economy depends on it for sustainable development. Refer to *Toolkit 3.8 – Create Environmental Awareness* for ideas about environmental days celebrating water.



WASTE PREVENTION

Littering is a big problem in Namibia – both due to a lack of waste management systems and people’s “don’t care” attitudes. But what is the root cause of the problem? Why is there waste in the first place?



Waste and the pollution that it causes results in many environmental and social issues, for example: plastic pollution threatens both marine and land organisms, and ever-growing landfills both release potent greenhouse gases into the atmosphere and harmful chemicals into our groundwater.

We can start teaching about waste, by first distinguishing between **waste** and **pollution**, but then also explore how they are linked and the many environmental impacts they cause (refer to **Toolkit 3.1 - Teach about the Environment**). Then we can explore the many solutions, such as reducing, reusing, recycling and many more “R”s. Teaching about sustainable production and consumption and SDG12 is important to create an understanding of the link between what is produced, what we consume and what we throw away.



1. Rethink
2. Refuse
3. Reduce
4. Repurpose
5. Reuse
6. Recycle
7. Repair



As an introduction, let your senior primary learners read and complete the **Bush Telegraph: Rethinking Waste**.



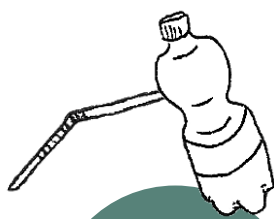
Teach your senior primary learners the “7 Rs concept” using the **Sustainable Waste Management** comic.



Use the infographics and lesson plan ideas in **UNESCO’s Trash Hack** teacher’s guide to teach secondary learners about waste. Then, use the **Recycling and Waste Information Booklet** from RNF to learn about recycling different materials in Namibia.



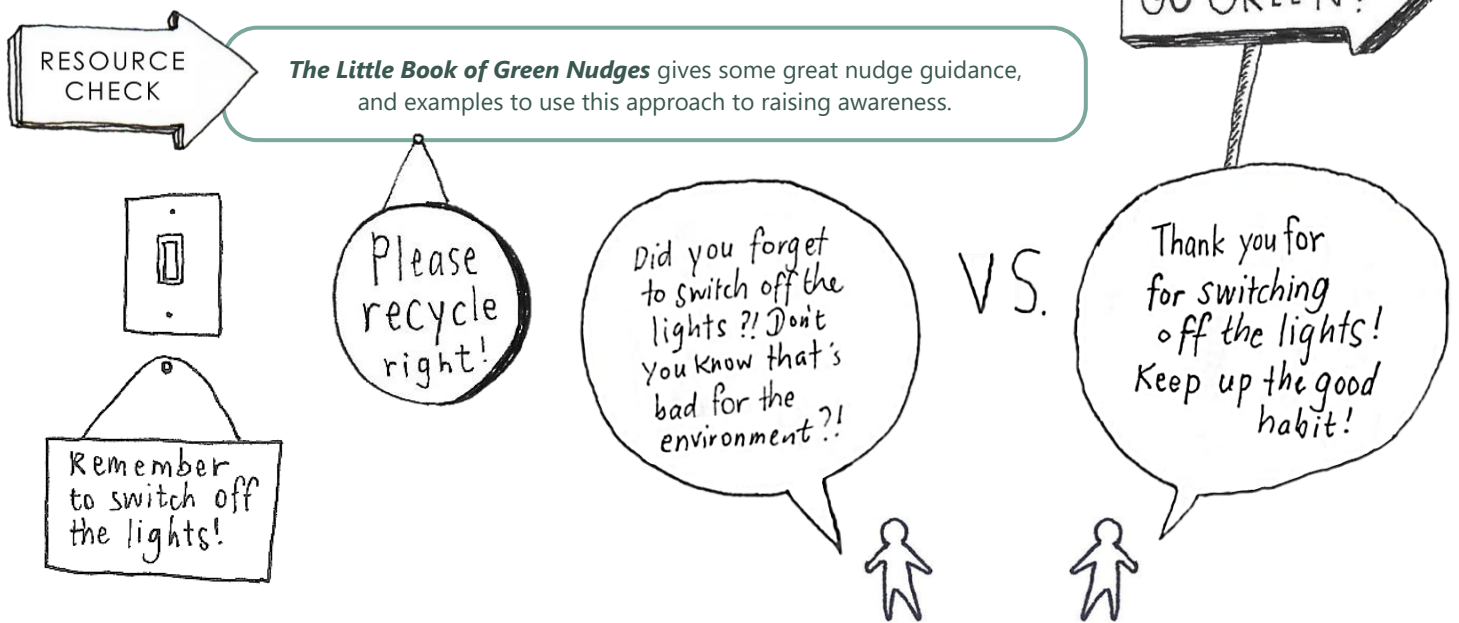
Once our learners have an understanding of the environmental issues of waste and the solutions, we can then start to discuss the type of waste that our school produces. The production of waste at schools differs greatly depending on the size, location and culture of the school. Is there a tuck shop and what does it sell? Homemade items, such as fat cakes? Or sweets and chips in plastic wrappers? Our classrooms and the office also produce waste. Does the school use both sides of paper? These all factor in to how large the task is to prevent wastefulness and to improve the waste management system.



GREEN NUDGING

Teaching about energy, water and waste is the beginning to having a better understanding of the resources and how we depend on them. But we can all reflect on our own behaviour and know that we often need to be reminded to do things - such as turn off the lights. Sometimes we may not have the time or know where to find the best environmentally friendly option. We can use friendly reminders in the form of little posters and signs and learn how to give sustainable options an advantage. These are called **green nudges**.

GREEN NUDGES
Positive and gentle persuasion to encourage sustainable behaviour.
UNEP, 2020



Sometimes we may find it uncomfortable to speak to others about their environmental actions and behaviours, or it may be culturally or socially unacceptable to do so. This is where green nudges can help us, as they focus on being positive and providing options instead of being reprimanding.

Raising awareness and improving understanding is *one step* towards motivating a change in our attitudes and behaviours. As educators, we are everyday role models for our learners and the community around us. Through our actions, we are directly and indirectly demonstrating environmental behaviour.



RESOURCE CHECK
Use Recycle Namibia Forum's **Recycling Poster**, and Rent-A-Drum's **What to Recycle poster** to communicate waste management in the classroom. Younger learners can make their own posters using the **Rubbish Ronnie colour-in posters**.



RESOURCES FOR RESOURCE CONSERVATION EDUCATION

Junior Primary

JP

Senior Primary

SP

Junior Secondary

JS

Senior Secondary

SS

Teacher

T

Environmental Learning with GCF Videos

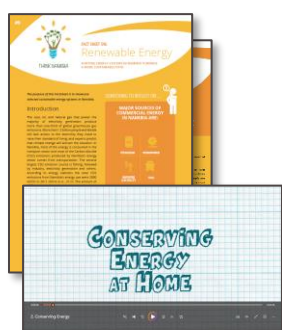


SP
JS
SS

VIDEO: These are easy to understand, educational videos on the topics of *Energy, Water Management, and Waste and Litter Management*. GCF has also produced videos on various other environmental topics such as *Ecosystems; Plants; Wildlife Conservation; and the Environment*. They clearly explain and illustrate the concepts and topics covered. The link is to a playlist of all the GCF learning videos done with One Africa TV.

AUTHOR: Giraffe Conservation Fund (2021)

Link: https://www.youtube.com/playlist?list=PL4VFia68Sc57ykrwLSZ_joRbykhY2i6



JS
SS
T

Think Namibia: Energy Resources

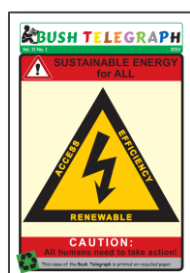
VIDEO, FACTSHEET & POSTER: These resources on *Conserving Energy and Renewable Energy* share on Namibia's sustainable energy systems and energy saving considerations respectively, aiming to educate on the topics.

AUTHOR: Think Namibia (2015)

Link 1: <https://www.thinknamibia.org.na/publications/videos>

Link 2: <https://www.thinknamibia.org.na/publications/factsheets>

Link 3: <https://www.thinknamibia.org.na/images/projects/enviro/Poster-04-RENEWABLE-ENERGY-IN-NAMIBIA.pdf>



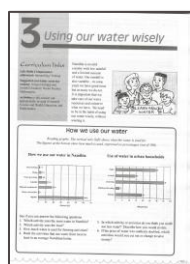
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Bush Telegraph: Sustainable Energy for All

BOOKLET: This issue explores sustainable energy for all which includes the concepts access, efficiency and renewable. There are several activities that learners can complete.

AUTHOR: NaDEET (2012)

Link: https://nadeet.org/sites/default/files/2012_1_BT_Sustainable%20energy%20for%20all.pdf



SP
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Caring for Our Water

ACTIVITY BOOK: This workbook for upper primary school teachers and learners. It shows how Namibian's use water and how it can be used more wisely, including practical tips and a worksheet for water auditing (see the chapter on *Using our Water Wisely*).

AUTHOR: The Wetlands Working Group of Namibia (2007)



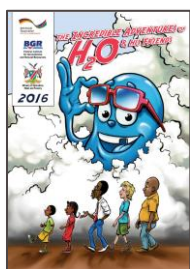
T

Blue Gold – Our Drinking Water and Climate Change

MANUAL and ACTIVITY BOOK: This learning material on water includes a teacher’s handbook, background reading and guidance on the material, a student workbook and quiz cards as part of the activity material.

AUTHOR: M. Kasper-Claridge. Global Ideas (2020)

Link: <https://www.dw.com/en/learningpack-drinkingwater/a-54088816>



SP

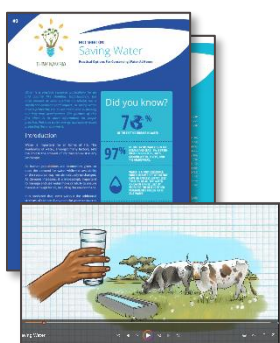
JS

The incredible adventures of H₂O & his friends

COMIC: This useful and entertaining comic can be used in various subjects to explore the water cycle, groundwater, the water table and importantly threats, such as water pollution, to this precious resource.

AUTHOR: V. Witts (Clever Clogs Productions), K. Swanepoel & A. Beyers (Picsapien illustration & design), C. Lohe & M. Quinger (BGR) (2016)

Link: https://www.bgr.bund.de/EN/Themen/Wasser/Produkte/Downloads/comic_h2o_en.pdf?__blob=publicationFile&v=10



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Think Namibia: Water Resources

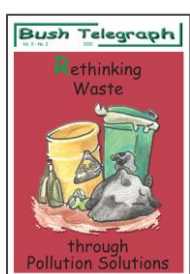
VIDEO, FACTSHEET and POSTER: These resources on *Saving Water*, *Water Pollution* and *Water Innovations* are from a Namibian perspective; shared with a view to educate on the importance of water saving, and how best to do so in the Namibian context.

AUTHOR: Think Namibia (2015)

Link 1: <https://www.thinknamibia.org.na/publications/videos>

Link 2: <https://www.thinknamibia.org.na/publications/factsheets>

Link 3: <https://www.thinknamibia.org.na/images/projects/enviro/Poster-02-NAMIBIAS-INNOVATIVE-APPROACHES-TO-ADDRESS-WATER-INSECURITY.pdf>



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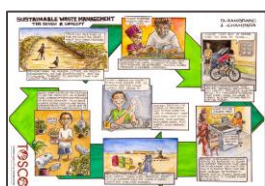
T

Bush Telegraph: Rethinking Waste

BOOKLET: This issue explores the issue of pollution and waste, and what we can do against it, such as implementing the 3 R’s.

AUTHOR: NaDEET (2010)

Link: https://nadeet.org/sites/default/files/pdf/educational_material/Bush%20Telegraph%209%20No%202.pdf



SP

JS

Sustainable Waste Management – The Seven R Concept

COMIC: This Namibian comic illustrates the “7 R concept” of sustainable waste management. It uses simple pictures and descriptions to educate on the concept, in a way relatable to Namibian learners.

AUTHOR: D. Zambrano, J. Champana (2021)

Link: <https://conservationoptimism.org/creating-conservation-awareness-in-young-audiences-with-cartoons/>



T

Trash Hack: Action Learning for Sustainable Development

MANUAL: This guide provides information, activities and guidance on “trash” awareness and management in schools and associated communities. It illustrates the link between engaging with the trash issue and ESD.

AUTHOR: UNESCO (2021)

Link: <https://unesdoc.unesco.org/ark:/48223/pf0000375408>



JS

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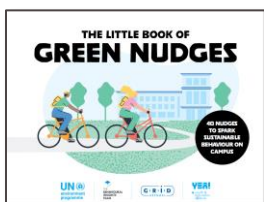
T

Recycling and Waste

BOOKLET: This informational booklet is a brief introduction to recycling and waste. It provides some facts on waste and recycling in Namibia, and why it is important to implement the 5 Rs rule. It further provides an overview of the different recyclable materials.

AUTHOR: Recycle Namibia Forum (2023)

Link: https://rnf.com.na/sites/default/files/downloads/RNF-Recycling_Info_0.pdf



SS

T

The Little Book of Green Nudges

BOOK: Created to encourage sustainable practices on a campus, this book gives practical guidance on how to effectively communicate sustainable actions and awareness, and suggests what the actions could be.

AUTHOR: United Nations Education Programme (2020)

Link: <https://www.unep.org/resources/publication/little-book-green-nudges>



JS

SS

T

What to Recycle Poster

POSTER: This poster provides a list of which materials can be recycled at Rent-A-Drum facilities, and what not. This is useful to have at recycling stations that will end up at Rent-A-Drum recycling plants.

AUTHOR: Rent-A-Drum (2020)



JP

SP

RNF Recycling Posters

POSTER: This poster illustrates recycling fundamentals, raising awareness for this form of waste management.

AUTHOR: Recycle Namibia Forum (n.d)

Link: <https://rnf.com.na/printable-posters>



JP

SP

Rubbish Ronnie Colouring Book

COLOURING BOOK: This booklet is filled with black and white line drawings about the 7 R's, which are designed to be coloured in. Each page can be a different poster.

AUTHOR: Recycle Namibia Forum (n.d)

Link: https://rnf.com.na/sites/default/files/downloads/Rubbish_Ronnie_Colouring_Book.pdf

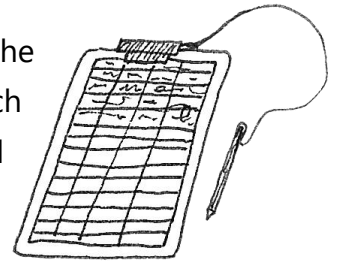
2. ENVIRONMENTAL AUDITING

Environmental auditing is one of the many environmental management tools we can use. Audits show where and how much of a resource is being used. This data can be evaluated to determine if the resource is being managed well or is being wasted.

ENVIRONMENTAL AUDIT

A systematic, documented, objective review of an organisation's resource use over a set period of time.

We may believe that we are wasting water in the kitchen, but find it is in a different place - such as the outdoor tap. Understanding the actual place where resources are used will help us make an effective management plan.



Use the **Bush Telegraph: Tools for a Sustainable School** to get an overview about environmental auditing.



PERSONAL AUDIT

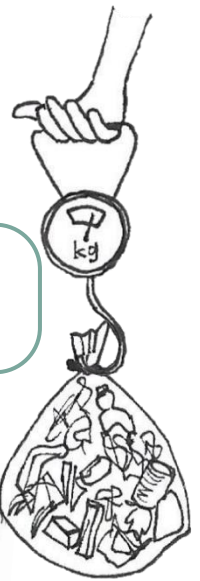
A good way for us to become more comfortable with auditing is to conduct our **own personal audit**. This is an enlightening way to find out our individual impact - be it positive or negative. There are many useful tools available to us online that have also been customized to Namibia.



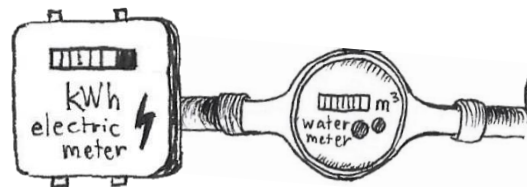
Use the **WESSA Share-Net** auditing worksheets on **How much waste do I produce** and **How much water do I use** to conduct personal impact audits.



Use these online consumption calculators and simulators to measure electricity and water consumption: **NEST Simulator** from the *Electricity Control Board*, **Water Footprint Calculator**, and for more check out the **Green Living Tools Online Calculators**.



It costs money to produce, deliver and in some cases remove resources after use. The less you use, the less you pay!



Have you done an audit before? Try it out at home too!



SCHOOL AUDIT

SETTING UP AN AUDIT



An essential part of auditing is collecting information that we can use to **compare** and **evaluate**.

STEP 1: Determine **what** will be audited.

We first need to decide on the scope of the audit. We can choose to only audit energy or we may decide to audit energy, water and waste.



Use **Audit: School, Home and Community Water Use** for water auditing and Chapter 3, **Using Our Water Wisely**, in **Caring for our Water**. Use the **Guideline for Schools to do Self-Energy Audits** from Eskom for electricity auditing.



STEP 2: Decide **where** at the school will be audited.

Will we conduct a classroom audit, certain buildings or the entire school?

Involve the institutional workers and ask them for help...

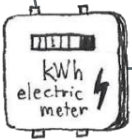
STEP 3: Determine the **time intervals** when data will be collected.

For example, in a daily water audit we will need to read the water meter at the same time every day.



STEP 4: Identify the school's **water** and **energy** meters.

What to do if you do not have meters or access to a meter? We can use many of the audit manuals to guide us in how to measure resource consumption without a meter. For example, we can calculate how much energy is used by lights in a classroom with the following information:



Type of lightbulb (LED/ Incandescent / CFL) :
 (# of lightbulbs X Watts X Running time) / 1000 = kWh

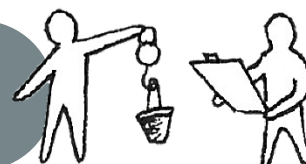
STEP 5: Design or adapt a **data collection sheet**.

Make sure that you are able to measure what the data collection sheet asks and vice versa.



Use the **Global Change Green Audit Toolkit** booklet, guide and sheets to help get started in setting up an audit.

STEP 6: Decide **who is responsible** for collecting the data and **how** this will be done as planned.

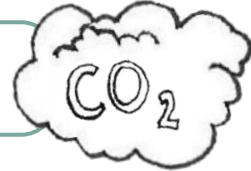


INVESTIGATING FURTHER

An audit gives us a 'snapshot' of our resource use for the time period that was examined. It allows us to focus on areas that need the most improvement. We can then use this information to look at the bigger picture. For example, we can use our collected data to measure our carbon footprint in order to act against climate change.

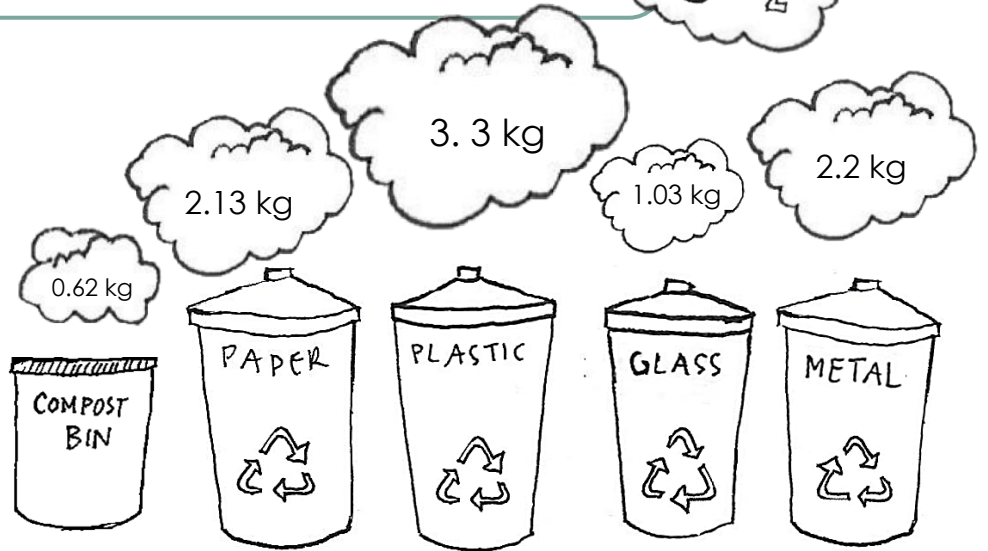


Use WESSA's **My Carbon Footprint** to see the link between resource management and the reduction of our carbon footprint.



"Everything you throw away was made somewhere in a factory. This process of making the item released CO₂ emissions."

WESSA, 2016



*kg CO₂ produced per 1 kg of waste

REPORTING & SETTING UP A RESOURCE MANAGEMENT PLAN

An important part of auditing is giving feedback to everyone who has been involved in the audit: learners, teachers and other school stakeholders. A good way to do this is using graphs to show the usage over time.



Use the chapter **Organising Your Information** from *Tools of the Trade* to learn how to make graphs to show the audit data.



This information can be used to set up a management plan to better use the resource and ensure that the results of the audit are acted upon.

An audit can be used as an awareness raising tool!



Use **Section 2 - 4**, which covers water, waste and sewerage, and energy management, in the **Eco Awards Good Practices Handbook** as a guide for resource management plan ideas.

RESOURCES FOR ENVIRONMENTAL AUDITING

Junior Primary



Senior Primary



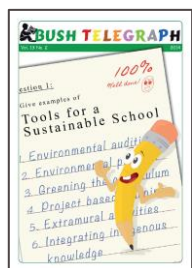
Junior Secondary



Senior Secondary



Teacher

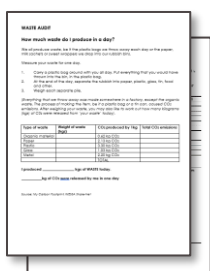


Bush Telegraph: Tools for a Sustainable School

BOOKLET: This issue explores the elements of a sustainable school; what makes a school sustainable, how to achieve this and the relevance of it. It equips learners with activities, suggestions and information.

AUTHOR: NaDEET (2014)

Link: https://nadeet.org/sites/default/files/2014_2_BT_Tools%20for%20Schools.pdf

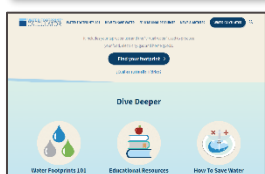


WESSA Share-Net Audit Worksheets

ACTIVITY SHEET: These auditing sheets for a *Water Audit* and a *Waste Audit* are designed for children to run these audits at home or school. They include "how to" and guidance and information on the calculations.

AUTHOR: WESSA Share-Net (2016)

Link: <http://learningthroughnature.co.za/resourcedownloads/audits-pack1-1-7mb-zipped/>



Consumption Calculators and Simulators

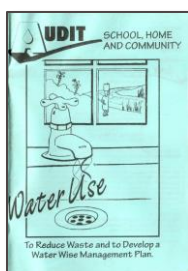
WEBSITE: These interactive sites calculate and simulate consumption of energy, water and demands on other resources. Their design allows for the comparison and analysis of appliance demands and consumer habits.

AUTHOR: Electricity Control Board, GRACE Communications Foundations, Calculators.ORG

Nest Simulator: <https://nest.org.na>

Water Footprint Calculator: <https://www.watercalculator.org>

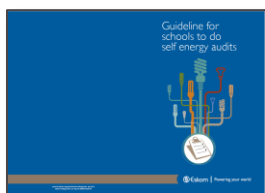
Green Living Tools Online Calculators: <https://www.calculators.org/health/green.php>



Audit School, Home and Community Water Use

ACTIVITY BOOK: This student workbook (teacher guidance and ideas included) focusses on educating on water audits for the purpose of raising awareness to water saving.

AUTHOR: National Water Conservation Campaign, Share-Net (n.d)



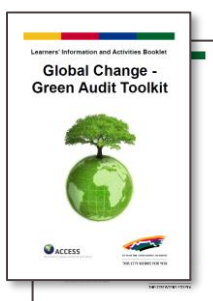
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Guideline for Schools to do Self-Energy Audits

MANUAL: This booklet educates on electricity usage and the assessment thereof whilst giving guidelines and material for running an energy audit at school. It includes formulas for calculating the cost of used electricity.

AUTHOR: ESKOM (2016)

Link: [https://www.eskom.co.za/sites/idm/SchoolYard/Documents/36%202768_Eskom%20Energy%20audit%20guide%20for%20schools%20\(a%20guide%20to%20help%20schools%20audit%20their%20energy%20use\).pdf](https://www.eskom.co.za/sites/idm/SchoolYard/Documents/36%202768_Eskom%20Energy%20audit%20guide%20for%20schools%20(a%20guide%20to%20help%20schools%20audit%20their%20energy%20use).pdf)



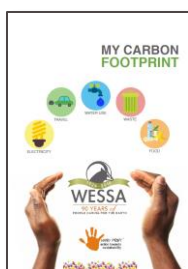
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Global Change - Green Audit Toolkit

MANUAL and ACTIVITY SHEET: This toolkit (*Educator's Guide, Learner's Booklet, Activity Sheets, and Audit Sheets*) is created to inform a school green audit. It contains the supporting information, relevance and practical steps and material for conducting a school audit.

AUTHOR: Africa Centre for Climate and Earth Systems Science (2009)

Link: <https://ibali.uct.ac.za/s/ccse/item/13428>



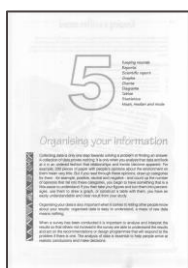
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My Carbon Footprint

MANUAL: This practical lesson plan and activity sheets audits using the concept of "carbon footprint". It explains what it is and then guides through the footprint auditing and related activities.

AUTHOR: WESSA (2016)

Link: <https://ibali.uct.ac.za/files/original/8a2952ea1e92970459f100865420124d568e8976.pdf>

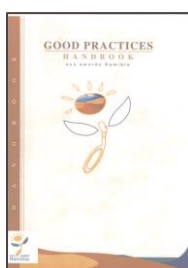


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Tools of the Trade

CHAPTER: This textbook chapter (*Organising your Information*) informs and guides on how to organise data. It explains different methods, when to use them, how to process and present data, and gives visual examples.

AUTHOR: D. du Toit, T. Sguazzin (1995)



T

Eco Awards Good Practices Handbook

MANUAL: This is a guidebook for the tourism industry on sustainable tourism principles. It is informative on good practice guidelines and can be applied to schools as well.

AUTHOR: J. Tarr, P. Tarr, T. Parkhouse (2005)

Link: <https://ecoawards-namibia.org/sites/default/files/2017-01/eco%20awards%20Namibia%20Good%20Practice%20Handbook.pdf>

3. RESOURCE-EFFICIENT SCHOOLS

Once we have raised awareness and conducted our environmental school audit, there are many areas where we can create considerable change in our school. We can change our infrastructure, integrate sustainability into existing endorsed programmes and initiatives, and implement changes to how schools are operated.



INFRASTRUCTURE

For our schools to become more sustainable in their resource use, we can address our infrastructure. Ideally, we can build our schools using an ecological design, but most of us are working in existing buildings. Here we can act by addressing maintenance issues that may be causing the wasting of resources, as well as opportunities for improving our efficiency to become less dependent on fossil-fuel energy. This is one place we can react to the outcome of our environmental audits. Some adaptations can cost almost nothing as they may simply be to improve the location of waste bins, while others may require us to fundraise or source a donor to realise our aims.

Look around!
Where can we begin adapting our infrastructure to make it more sustainable?



Be inspired by these videos: *Amazing Kids Private School Going Green*, *Eco sanitation and Water Harvesting at Kakoma Primary* and *Solar Power Installed at Ohangwena Schools*.

MAINTENANCE

From fixing leaking taps to replacing broken windows and doors, a well-maintained school is an important step in saving resources and taking ownership. We can work together with institutional staff and the leadership to help realise our goals.



Ensure that your school has a budget for minor repairs to not fall in the trap of waiting for outside assistance.



See the *Manual on Maintenance & Minor Repairs on Buildings* for guidance as to how to make our schools last longer.

ENERGY EFFICIENCY AND RENEWABLE ENERGY SYSTEMS

Our school buildings often lack **energy efficiency**. Understanding how to improve the energy efficiency of our buildings is a first step in long-term improvements. We can look at different areas including lights and equipment, as well as the designs of our buildings.

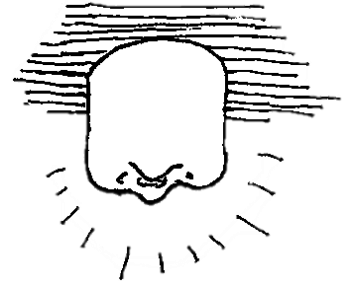


ENERGY EFFICIENCY

Using less energy to perform the same task.

TOOLKIT 3.6 REDUCE RESOURCE USE

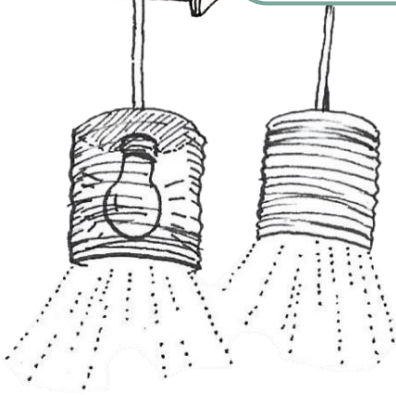
Although we may not be able to alter the building, we may be able to re-orientate furniture or allocation of classrooms to reduce energy needed (i.e. lights during the day). Some of our schools are fortunate to have their own solar systems for electricity. Even if we are not so fortunate, we can also use solar energy through self-made bottle skylights.



Refer to the energy calculators from the previous section for information about lightbulbs and equipment and look at **Energy Efficiency in Building** to get ideas to reduce energy wasting in buildings.



Look through **It's Time to be Efficient** for different low-cost ideas and building plans for sustainable infrastructure.



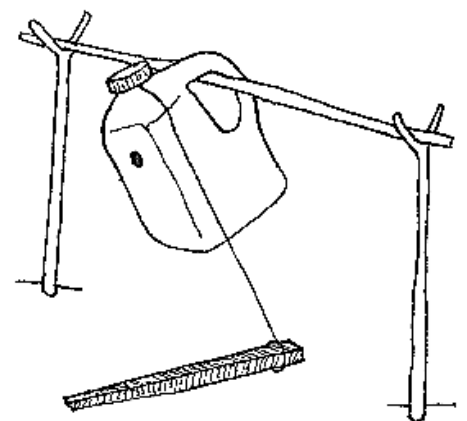
We often use lighting to combat crime and improve safety for our community. However, this can lead to light pollution if the lights are not installed correctly. It is also energy wasting. Correctly installing outdoor lighting can still serve the purpose, but also protect the environment.



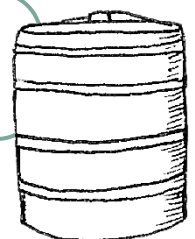
Read the **Bush Telegraph: Light Pollution** to get ideas to reduce energy wasting.

SUSTAINABLE WATER AND SANITATION SYSTEMS

Well-maintained water and sanitation systems are important for ensuring the health and well-being of the learners and teachers, as well as the environment. Many schools have constructed **tippy-taps** as a response to COVID-19 and developed hygiene plans. We can save water by investing in water tanks to collect rainwater from our school roofs or construct dry toilets in a safe and sanitary way. It is important to provide proper facilities for the general well-being of our learners and the whole school community. Refer to **Toolkit 3.7 – Promote Learner Well-being**.

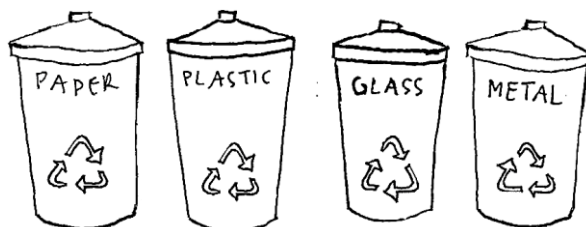


Read the flyers **How to Make a Tippy Tap** and **Grey Water Filter**, and the booklets **Otji-Toilet Self Builder Manual** and **Bush Telegraph: Sanitation for a Healthy Environment** for improving water and sanitation infrastructure at your school.



WASTE MANAGEMENT SYSTEMS

Many of us already conduct litter clean ups; however, we can do more by improving our waste collection and management systems at school. Make sure to have sufficient bins around the school to prevent littering. Even if we do not live in an area that has access to recycling centres, we can separate waste to reclaim items that are reusable.



Use the **Recycling Guide** from RNF to set up a recycling system for your school. Visit the **RNF Green Directory** website to find local businesses or initiatives that provide waste solutions.



SCHOOL PROGRAMMES & INITIATIVES

Established school programmes are also an important place for us to green our school. These can include on-going, nationally-coordinated programmes, such as the school feeding programme, as well as initiatives such as the UNESCO Associated Schools Project (ASPNet) or Social Accountability and School Governance initiative. These are complementary, and we can often utilise the same resources for dual purposes. By working and collaborating on initiatives we can improve the overall quality of our schools.

NATIONAL SCHOOL FEEDING PROGRAMME

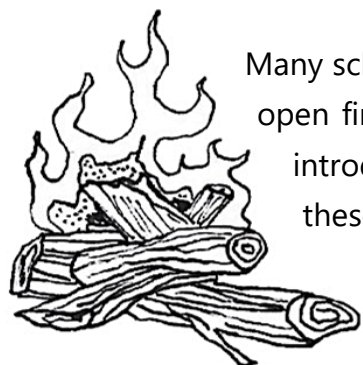
The Namibian National School Feeding Programme provides thousands of children with a meal during school hours. We should audit the environmental impact of the programme at our schools with a focus on energy use and nutrition. Then we can plan as to how we can make the feeding programme more sustainable by addressing SDG3 and SDG7.



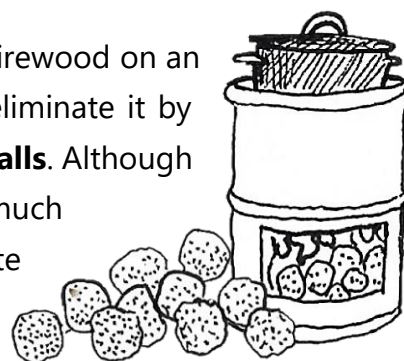
Become familiar with **NSFP Implementation Action Plan (2019-2024)** especially regarding the use of energy saving stoves and use of gardens.



Read the comic **Making your School a Better School** for ideas on engaging with stakeholders.



Many school feeding programmes prepare meals using firewood on an open fire. We can reduce the amount of firewood or eliminate it by introducing **fuel-efficient stoves** and **recycled fire balls**. Although these still produce smoke (and thereby CO₂), it is much less. Recycled fire balls help to re-use paper waste products and reduce deforestation.

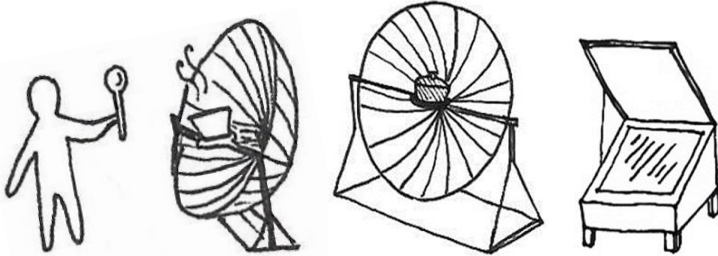


TOOLKIT 3.6 REDUCE RESOURCE USE

The production of recycled fire balls can be done as a class project or as an after-school activity. Many of our schools already have large black cooking pots that make using a fuel-efficient stove difficult; however, it is still possible to construct wind blocks, improving the cooking efficiency.



See ***It's Time to be Efficient*** where you can learn how to make a fuel-efficient stove and recycled fire balls on **pg.18**.

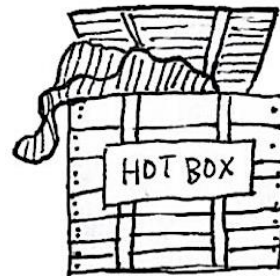


We can make our cooking 100% carbon-free by introducing solar cooking. This will require us to adjust our methods in cooking, but with significant financial savings.



Use the following resources to understand solar cooking and how to do it: ***It's Time to Solar Cook***, ***Here Comes the Sun*** and ***Solar Cookers: How to Make, Use and Enjoy***.

We can keep our food warm for longer by using a hotbox instead of using more energy to re-heat our food. In addition, many of our school kitchens lack insulation. They are very hot in summer and very cold in winter. This can also be addressed through greening initiatives.



Make sure to include the staff or volunteers who prepare the food in the "greening" process.



Use the ***Shack Insulation Guide*** to improve insulation with re-usable materials.

We can improve other aspects of the school feeding programme by ensuring that our school gardens provide the kitchen with nutritious vegetables and fruits – see ***Toolkit 3.7 – Promote Learner Well-being***. In return, our school kitchens can provide the garden with organic waste (uncooked food) for the compost heap.

It is essential that we reduce our food waste.

We can do this by:

- carefully planning our meals
- storing food items correctly
- using vegetable peels or bones to make stock.



"If food wastage were a country, it would be the third largest (greenhouse gas) emitting country in the world."

FAO, 2015

INSTITUTIONAL PRACTICES

Aside from making our school infrastructure and programmes more resource-efficient, we can also reduce resource use in daily routines, purchases and our institutional practices. This requires behavioural change among learners and all staff members and may also require changes to school policy and governance.

SCHOOLGROUND LITTER CLEAN-UP

Many schools have a litter clean-up as part of their regular routine. With a clean schoolground we can give a good first impression to new visitors. It informs our school community that a clean school environment is valued. It is important that we do not use clean-ups as a form of punishment. Instead, we can make this into a learning opportunity and ensure that all are involved. The lesson of a litter clean-up should not (only) be to “keep our environment clean”, but also that “we need to stop producing waste and not litter to begin with!”. We can truly make this a well-rounded ESD activity if we sort, audit, and recycle or reuse the waste that we have collected.

“Create leadership opportunities by pairing up older students with younger students to clear areas of the school together.”

ECOSCHOOLS
CANADA, 2014



Read the ***School Grounds Clean Up Campaign Kit*** for ideas on organising litter clean-ups in your school.



SCHOOL PROCUREMENT

Our staff meeting rooms, kitchen and the administration buildings of the school are also important areas to improve environmental practices and purchases. Refer to ***Toolkit 3.4 – Develop ESD Leadership*** on policies and develop a green procurement policy for typical school purchases.

Here are some tips for improving our own sustainable procurement:

- Make sure to always take a **cloth bag** when purchasing items for the staff kitchen
- Buy food items in bulk and store in **reusable containers**
- If possible, don't buy items in plastic packaging
- **Support local** entrepreneurs and businesses
- Buy **healthy food** items
- Serve from **reusable tableware** instead of throw-away items



Here are some ways to have a “greener” office, staffroom, and classroom:

- Make sure to **reuse paper**, e.g. print/write on both sides
- **Save wastepaper** for making **recycled fire balls**
- Move desks closer to **natural light** to reduce the need to switch on lights



Look at **pgs. 8 and 18** in the ***Staff Guide for a Green UNESCO*** for more tips on greening staff offices, staff rooms and kitchen.

COMMUTE TO SCHOOL

Where we go to school and how we get there plays an important part of our school life. For those of us whose schools do not have hostels, commuting takes place on a daily basis. It involves any combination of vehicles (private or public), walking to school and in a few cases bicycles. We can conduct an environmental audit on school transport to get a better understanding of our school's situation. Some learners may come from far distances, so to make walking safer, we can organise a "walking bus" to school. Let us set a good example and reduce our carbon footprint!

WALKING BUS

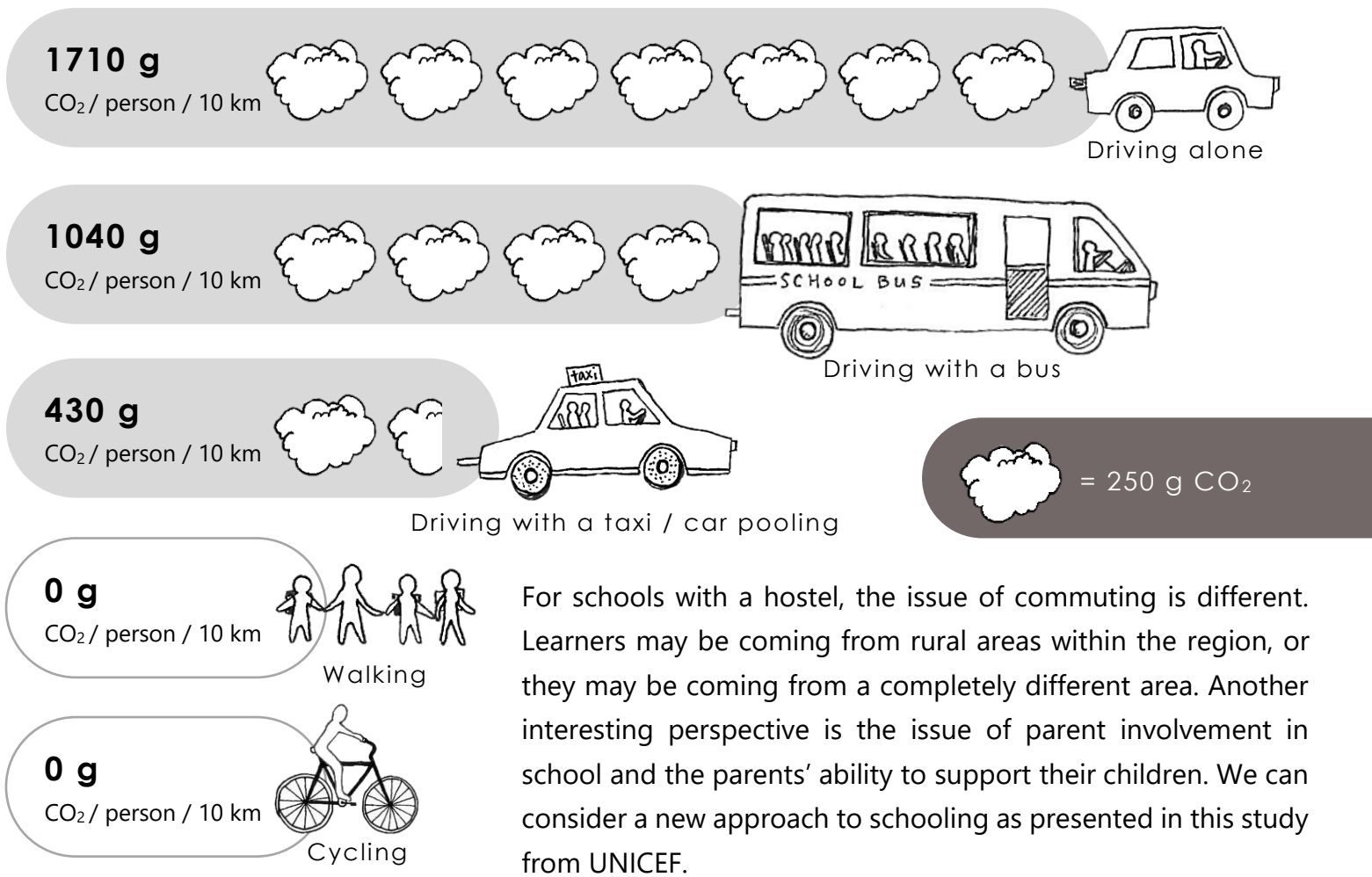
A group of children walk to or from school supervised by volunteer adult escorts.

UK DEP. FOR EDUCATION AND SKILLS, 2007



Read about how to organise a walking bus on **pg. 3** of *Top Tips for Sustainable School Travel*.

CARBON DIOXIDE EMISSIONS OF DIFFERENT TYPES OF TRANSPORT



For schools with a hostel, the issue of commuting is different. Learners may be coming from rural areas within the region, or they may be coming from a completely different area. Another interesting perspective is the issue of parent involvement in school and the parents' ability to support their children. We can consider a new approach to schooling as presented in this study from UNICEF.



Read the *UNICEF* report on **Free Home-to-School Learner Transport** to view this issue from a different perspective.

RESOURCES FOR RESOURCE-EFFICIENT SCHOOLS

Junior Primary



Senior Primary



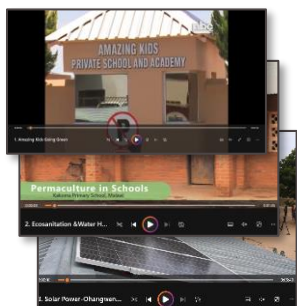
Junior Secondary



Senior Secondary



Teacher



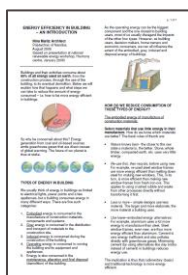
Schools Greening Infrastructure Videos

VIDEO: These videos show different examples of schools that are implementing sustainable infrastructure. From solar power to rainwater harvesting and eco-sanitation, the videos explain the various methods, impacts and how the schools have been able to fund the projects.
AUTHOR: Namibian Broadcasting Corporation (2018), Empower Projects (2019), Think Namibia (2019)
 Link 1: <https://www.youtube.com/watch?v=8aHwAMVmdlc>
 Link 2: https://www.youtube.com/watch?v=phA_wMwhZYA
 Link 3: <https://www.youtube.com/watch?v=p0DQ5cEDJ3w>



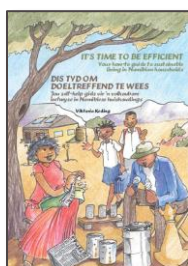
Manual on Maintenance and Minor Repairs on Buildings – “Schools Lasting Longer”

MANUAL: This how-to styled guide advises how to maintain and repair infrastructure in schools and similar buildings, including establishing and caring for sustainable school infrastructure.
AUTHOR: F. Olsson, O. Diawara, R. Buckland and M. Wilkinson (2007)
 Link: <https://ecoawards-namibia.org/sites/default/files/eco%20awards%20Schools%20Lasting%20Longer.pdf>



Energy Efficiency in Building – An Introduction

BOOKLET: This educational booklet explains the concept of energy efficiency in buildings and the various elements that improve efficiency. It gives guidance on achieving efficiency and awareness-raising activities.
AUTHOR: N. Maritz (2006)
 Link: <https://ecoawards-namibia.org/sites/default/files/2017-01/Eco%20Awards%20Energy%20efficiency%20in%20building.pdf>



It's Time to be Efficient

BOOKLET: This booklet guides on sustainable house-hold practices in Namibia. It contextualises why this is important, giving understanding to efficiency methods and practices, showing how to be an efficient home.
AUTHOR: V. Keding (2015)
 Link: <https://nadeet.org/sites/default/files/Its%20Time%20to%20be%20Efficient%20NEW%20Low%20Res.pdf>



Bush Telegraph: Light Pollution

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BOOKLET: This issue illustrates the negative impact of artificial light through explanations and visuals on the effect of light pollution, information on night sky features, and tips and activities that educate on the issue.

AUTHOR: V. Keding, NaDEET (2011)

Link: https://nadeet.org/sites/default/files/pdf/educational_material/Bush%20Telegraph%20Vol%2010.%20No.%202.pdf



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How to Make a Tippy Tap

HOW-TO: An instructive guide, this poster includes a materials list and visual aids on making a tippy tap.

AUTHOR: US Department of Health and Human Services Centers for Disease Control and Prevention (n.d)

Link: https://www.cdc.gov/healthywater/pdf/global/posters/11_229310-K_tippy_tap_print.pdf



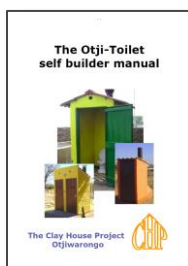
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Grey Water Filter

HOW-TO: This poster shows how to make a water filter out of upcycled materials. Listing materials needed, it illustrates how to prepare them and assemble the filtration system for the purpose producing grey water.

AUTHOR: Living Permaculture Project (2020)

Link: <https://livingpermacultureproject.files.wordpress.com/2020/08/grey-water-filter-poster-.pdf>



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Otji-Toilet Self Builder Manual

HOW-TO: This is the guide for a self-build of the Otji-Toilet, a toilet designed for the Namibian context, with sustainable sanitation practices. It includes photos and explains the installation process.

AUTHOR: Clay House Project (2009)

Link: <https://www.susana.org/resources/documents/default/2-916-otji-toilet-for-self-builders-small1.pdf>



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Bush Telegraph: Sanitation for a Healthy Environment

BOOKLET: This issue focuses on the environmental and human health impact of sanitation practices. It educates on the problem, it's effect and guides on practicing human and environmentally-friendly sanitation.

AUTHOR: V. Keding, NaDEET (2009)

Link: https://nadeet.org/sites/default/files/BT_Sanitation.pdf



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Recycling Guide

MANUAL: This is a straightforward step-by-step guide for businesses, households, and schools on collecting, sorting and selling recyclables in Namibia. It provides clear descriptions of the different recyclable materials, with pictures as examples.

AUTHOR: Recycle Namibia Forum (RNF) & Development Workshop (2023)

Link: https://rnf.com.na/sites/default/files/downloads/Recycling_Guide.pdf



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Recycle Namibia Forum: Green Directory

PORTAL: This directory links the user to environmentally-conscious Namibian businesses. A major category is waste management, but the directory also includes green manufactures, shops and services.

AUTHOR: Recycle Namibia Forum

Link: <https://rnf.com.na/green-directory>



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Namibian School Feeding Policy Implementation Action Plan (2019-2024)

REPORT: This policy implementation plan outlines what the NSFP intends to achieve and the strategy and plans that are involved. It shows the objectives, targets and their timeline, as well as responsible parties.

AUTHOR: Namibia Ministry of Education Arts and Culture (2019)

Link: <https://www.nafsan.org/wp-content/uploads/2020/04/2019-School-Feeding-Policy-PRINT-2019.pdf>



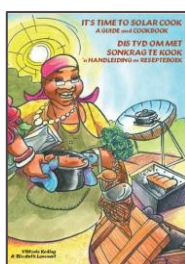
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Making Your School a Better School

COMIC: From all perspectives in the school community, this comic illustrates how schools can, and should, be held accountable for the provision of quality education in a safe environment.

AUTHOR: Legal Assistance Cente (n.d)

Link: <http://www.lac.org.na/projects/grap/Pdf/comicsfeedingtextbooks.pdf>



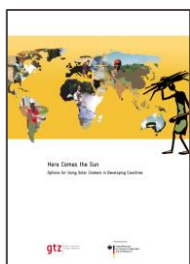
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It's Time to Solar Cook – A Guide and Cookbook

BOOKLET: This guidebook focuses on the why and how of solar cooking. It is aimed for adults and also includes recipes in English and Afrikaans.

AUTHOR: V. Keding, E. Lammert (2010)

Link: https://nadeet.org/sites/default/files/pdf/educational_material/It's%20Time%20to%20Solar%20Cook.pdf



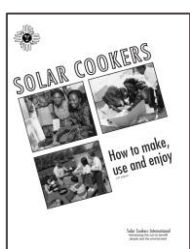
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Here Comes the Sun – Options for Using Solar Cookers in Developing Countries

BOOKLET: This case study booklet shows examples of solar cooking across various developing countries. It highlights the different methods, trends and practices.

AUTHOR: GTZ (2007)

Link: <https://www.ctc-n.org/sites/default/files/resources/gtz-en-here-comes-the-sun-2007.pdf>



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Solar Cookers: How to Make, Use and Enjoy

MANUAL: This booklet explains the concept of solar cooking, types of cookers and guides on their creation and use. It includes building plans, recipes, tips and ideas for teachers to engage students in solar cooking.

AUTHOR: Solar Cookers International (2004)

Link: [http://www.solarcookers.org/files/7914/5687/8521/How to make use understand English Update.pdf](http://www.solarcookers.org/files/7914/5687/8521/How_to_make_use_understand_English_Update.pdf)



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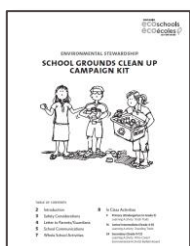
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Shack Insulation Guide

HOW-TO: This guide illustrates how to insulate a shack and explains the difference it makes, and how. It includes a materials and tools list, followed by a step-by-step guide, on how to install the insulation.

AUTHOR: Living Permaculture Project (2020)

Link: <https://livingpermacultureproject.files.wordpress.com/2020/08/shack-insulation-poster-.pdf>



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School Grounds Clean Up Campaign Kit

MANUAL: This booklet guides on initiating and running a school clean-up campaign. It also gives ideas for corresponding whole school and in-class (per phase) activities, including corresponding supportive materials.

AUTHOR: EcoSchools Canada (2014)

Link: https://ecoschools.ca/wp-content/uploads/2014/11/ES-KIT-CleanUp_FIN.pdf



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Staff Guide for a Green UNESCO

MANUAL: This guide provides examples of daily best practices and activities for greening offices and employees. Practical tips are given for work, home, and commuting, with the inclusion of relevant environmental policies.

AUTHOR: UNESCO (2020)

Link: <https://unesdoc.unesco.org/ark:/48223/pf0000375334>



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Top Tips for Sustainable School Travel

MANUAL: Presenting 10 tips, this guide gives practical, easy to implement ways to increase sustainability of school travel from an urban perspective. It takes safety into consideration and uses a whole school approach.

AUTHOR: CORE (2007)

Link: <https://core.ac.uk/download/pdf/4157655.pdf>



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Free Home-to-School Learner Transport

REPORT: This review explores the possibility of a free school commute for learners in Namibia. It explains the current transport issue and outlines the social implications and financial logic of offering a free system.

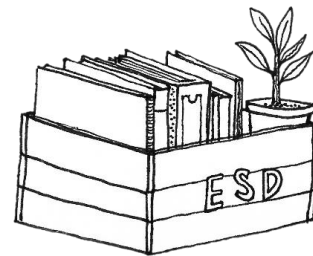
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Link: https://docplayer.net/150329700-Free-home-to-school-learner-transport-a-possibility-for-namibia.html#google_vignette



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