

TEACH for ESD



CELEBRATE THE ENVIRONMENT

OVERVIEW

As the world becomes more urbanised and biodiversity is lost, more and more people are losing direct experiences and familiarity with nature – which can lead to ignorance and apathy. If we want our learners to take positive environmental action, we need them to *care* about nature – for “... in the end, we will conserve only what we love...”. We must not forget that nature is beautiful! We should take the time to celebrate and enjoy it!

One way that we can champion the environment is by celebrating **an environmental day**. There are various special days to choose from throughout the year, to celebrate at our schools and in our communities. We can have fun and be creative in expressing our love and appreciation for the environment by **using the arts**. This can be done through different mediums such as drama, murals, songs and posters. **Teaching about nature** can provide knowledge, improve understanding and thereby inspire an appreciation for nature.

1. AN ENVIRONMENTAL DAY



There are now environmental days for almost every environmental topic!

Environmental days are an opportunity to come together as a global community, to raise awareness and educate ourselves and others about important environmental issues. They encourage people to appreciate and celebrate the wonders of the natural world. We can choose to celebrate environmental days that are relevant to Namibia, or we can choose days that provide an opportunity to learn about something outside of the Namibian context.

To get started, we can familiarise ourselves with an annual environmental calendar. A successful environmental day celebration needs to be planned well in advance!



RESOURCE CHECK

For a quick overview of environmental days in the year, look at the **WESSA 2021 Environmental Days Calendar**.

There are several organisations in Namibia - such as the Ministry of Environment, Forestry and Tourism and local NGOs - that officially celebrate certain environmental days, making it easy for us to join them.

Toolkit 1 – Environmental Knowledge provides the theory for many of the environmental days.

DAYS ABOUT SPECIAL ANIMALS

There are several NGOs in Namibia that focus on the conservation of specific animals. We can use their resources to educate our learners about these special animals – many of which are endangered – or organise a trip to their education center - see **Toolkit 3.8 - Teaching in the Great Outdoors**.

RESOURCE CHECK

Celebrate World Giraffe Day (21st June) using GCF's **Africa's Giraffe – A Conservation Guide** and the **GCF Nature Workbook**- ideal for senior primary school learners.

RESOURCE CHECK

Raise awareness about elephants on Elephant Day (12th Aug.) by using EHRA's **Elephant Conflict Mitigation** and **Junior Elephant Guard Course**.

RESOURCE CHECK

Celebrate Lions Day (10th Aug.) and World Cheetah Day (4th Dec.) using the Cheetah Conservation Fund's **A Predators Role in the Ecosystem**.

RESOURCE CHECK

Here is a **World Rhino Day Lesson Plan** to celebrate World Rhino Day (22nd Sep.).



DAYS FOR NATURE & SUSTAINABILITY

Environmental days about nature and sustainability offer opportunities to learn about other environments and how we can affect them, even though we may impact them. Wetlands are important, but vulnerable habitats – worthy to celebrate and protect.



RESOURCE
CHECK

Do you want to celebrate World Wetlands Day (2nd Feb.)?
Read the booklet **Wetlands of Namibia**.

Another well-known environmental day is World Water Day (22nd Mar.). Water is a very precious resource for Namibia (refer to **Toolkit 1.3 - Environmental Issues in Namibia** and **Toolkit 3.3 - Reduce Resource Use**). However, our soils are also a precious resource - we can raise awareness about the importance of soil health by celebrating World Soil Day (5th Dec.). Another popular environmental day is Arbour Day, which Namibia celebrates on the second Friday in October – why don't we all plant indigenous trees? Refer to **Toolkit 3.4 - Bring Biodiversity into the Schoolyard** for more resources on soil health and planting.

World Oceans Day (8th June) is celebrated annually by the Ministry of Fisheries and Marine Resources. We can find out what they are planning for the next World Oceans Day and join them if possible!



Watch the video **World Oceans Day for Schools 2020** and read the **Activity Guide: Increasing Ocean Literacy**.



There are some days that have similar themes such as Earth Day (22nd April) and World Environment Day (5th June) – both of which are quite broad and can entail anything regarding the earth or environment. Use **Toolkit 1** and **Toolkit 3.4** for ideas.



Watch the video on **World Environment Day 2021**.



Earth Hour (27th Mar.) is an hour where people all over the world turn off electrical appliances and lights, to raise awareness about the need to reduce the use of fossil fuels for generating electricity.

Let us reduce our waste by celebrating World Recycling Day (18th Mar.), World Clean-up Day (18th Sep.), Plastic Free July or the Zerowaste Week in the first week of September. Learn more about creative recycling projects in the following section, and go to **Toolkit 3.10 - Sharing with Others** and get more resources on how to organise clean-ups.



Watch the video **#itsup2us to make a better Namibia** to understand how it is our daily actions and attitude that make the difference.



2. USE THE ARTS

For many artists, nature was and still is a great source of inspiration. However, the arts can also inspire a love for the environment and play a powerful role in fostering a more personal and emotional connection between humans and nature. We don't have to be art teachers to incorporate the arts into our subjects.

"Every child is an artist. The problem is to remain an artist once they grow up."

PABLO PICASSO

The arts include:

- visual arts, e.g. painting or crafting
- music and singing
- poetry
- drama
- dancing
- storytelling



Art can also be a facilitator in understanding nature, as well as a means to grapple with and express concern about environmental issues. There is an abundance of resources on how to use the arts in environmental education – known as **Art-based environmental education**.

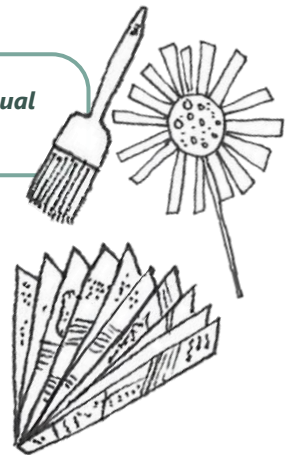
RESOURCE CHECK

To get an overview, read *Edu-Venture's Art-based Environmental Education Manual* which gives guidance on visual arts, music, poetry, drama and storytelling.

Creating and making art does not have to be expensive or difficult. Eco-art can be a creative recycling project for our learners!

RESOURCE CHECK

Get a variety of ideas on recycling crafts by reading *Recycled Arts and Crafts Guide* and the *It Costs Almost Nothing*



Children of all ages love and respond to music. We can let our learners write and compose their own songs about nature. If we have learners who can play instruments, we should involve them!

RESOURCE CHECK

Get musical: read *WWF's Environmental Studies – Magic with Music*.

RESOURCE CHECK

Together with your students watch the music video *Samalilani "Preserve"* – an environmental song from Zambian singers.



TOOLKIT 3.5 CELEBRATE THE ENVIRONMENT



Poetry is another powerful way that we can connect to nature. The Romantic era was a time where poets wrote a lot about their love and yearning for nature. We can encourage our learners to write their own poems about their favourite place in nature, or their favourite plant or animal.



Prompt learners to write different types of poems about nature using the document **Green Poetry**. For younger ages look at **It's Time to Grow** (found in the next section), which includes poems in five different Namibian languages!

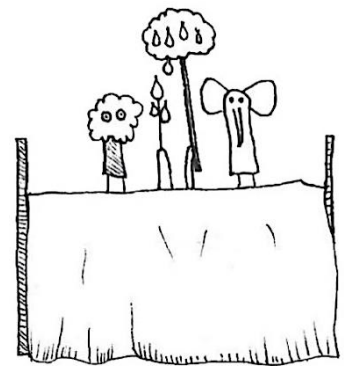
We can also get our learners onto the stage to celebrate nature in various types of performances. We can organise a fashion show made from recycled materials. We can challenge ourselves or our learners to choreograph a dance performance about the environment. This can be done in combination or separate to an environmental play.



Be inspired to dance for the environment by watching the videos **Rain Must Fall**, and **'Lily' Dance Production**.



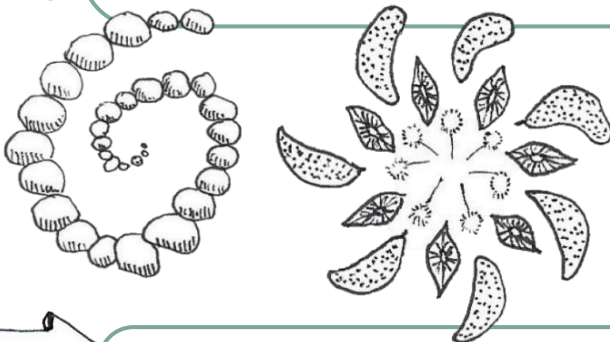
Look at the **Save The Lofty Trees** script – an example of an environmental play. Adapt this to the Namibian context.



Another form of art that we can do with our learners is **Land Art**. This has the advantage that we also go outside into nature! Anyone can be a land artist – small children, adolescents and adults!



Create Land Art with learners any age – get inspired by watching these two videos: **Outdoor Art with Andy Goldsworthy** and **Andy Goldsworthy-inspired Nature Art**.



Scan through the **Schools Tree Day: Nature Inspired Arts and Crafts** presentation.

LAND ART

Land art is an art movement that originated in the 1960s and 1970s. Land artists make their art outside in nature, only using natural materials found at that location e.g. soil, rocks, vegetation and water. The artwork is a natural part of the landscape and will eventually weather away again. Taking photos of the artwork is important to remember it.



3. TEACH ABOUT NATURE

Nature is usually seen as something to be taught by biology and geography teachers - but biodiversity, sustainability and the environment are concepts that can be taught across the entire school curricula!

Regardless of which subject we teach, there is always the opportunity to teach about nature - we can even team-teach or to combine subjects, e.g. biology and art. This is automatically taking an interdisciplinary approach, which is an essential part of ESD.

This section looks at *what* we can teach about nature in our different *subjects*. We can use this content to teach both inside and outside our classrooms. See **Toolkit 3.8** for more ways on *how* to teach about nature outside the classroom.



For an introduction on how to teach about nature in your subject, read the chapter "Incorporating EE" from *EduVenture's Teachers Training Manual – Biodiversity*.

PRE-PRIMARY & JUNIOR PRIMARY PHASE

The earlier we inspire an enthusiasm in our learners for nature, the better! Children are naturally curious and drawn towards nature.



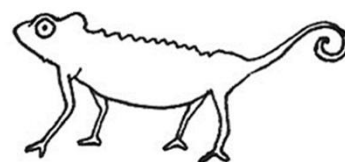
For teachers in the junior primary phase, have a look at NaDEET's ***It's Time to Grow: Animals and Plants***.



Use the Namibian ***PAKO Kids Magazine*** and their **website** to teach your junior primary learners about wild animals in a fun way.

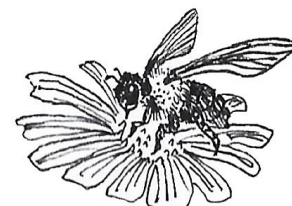


Environmental Education Activities for Primary Schools is a great resource to teach about natural science concepts in a practical way, using inexpensive materials.



BIOLOGY & ART

Both biology and art require close observations and entail the study of patterns. Art can help learners focus when studying plant and animals in detail. This can help them engage with the subject in a different way than they normally would in science.



Read the *East Africa Waldorf Teacher Programme's Human and Animal Study Manual for Grade 4-6* and the ***Plant Study Manual*** for ideas on how to use art for nature studies with primary school learners.

TOOLKIT 3.5 CELEBRATE THE ENVIRONMENT

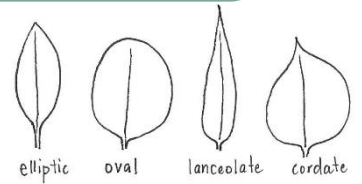
For upper primary or secondary phase learners, make nature journaling a part of a biology project.



Read the teacher's guide **STEM-Learning through Science-based Nature Journaling**, then watch and share the pdf slides **Nature Journal Ideas** with your learners for ideas.



If you're a secondary school biology or art teacher and want to go into depth about biodiversity, use the **UNESCO Biodiversity Learning Kit**.



Read **The Biodiversity Challenge Badge** booklet and use the corresponding lesson plans in **The Biodiversity Challenge Badge Resource and Activity Materials** to teach about biodiversity!

MATHEMATICS & SCIENCE 1, 1, 2, 3, 5, 8, 13, ...

In mathematics, we can include nature in topics such as geometry, statistics and drawing graphs. In upper primary and secondary phases, we can explore the Fibonacci sequence in nature!



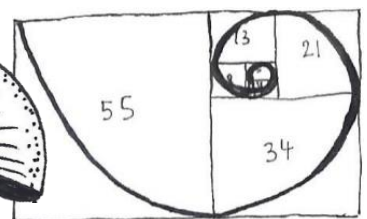
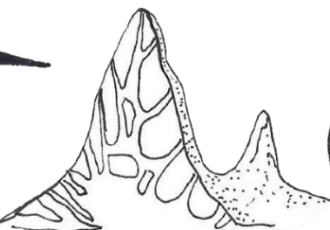
For some inspiration, watch the videos **Nature by Numbers** and **Spirals, Fibonacci and Being a Plant**.



$$\begin{aligned} 1 + 1 &= 2 \\ 1 + 2 &= 3 \\ 2 + 3 &= 5 \\ 3 + 5 &= 8 \\ 5 + 8 &= 13 \\ 8 + 13 &= 21 \\ 13 + 21 &= 34 \\ 21 + 34 &= 55 \dots \end{aligned}$$

BIOMIMICRY

is a new and exciting, interdisciplinary field in science and design, where problems are solved by studying and learning from nature.



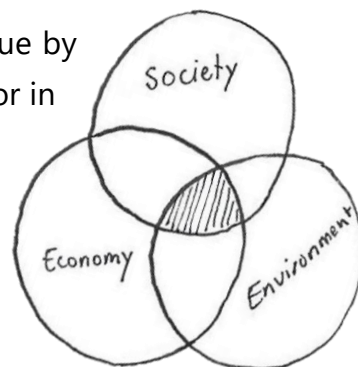
ACCOUNTING, BUSINESS AND LIFE SKILLS

In business, financial and lifestyle related subjects, we can teach about nature by introducing our students to ecosystem services. Our economies and businesses all depend on these ecosystem services in a direct or indirect way.



The WWF's **Nature's Services – A Guide for Primary School on Ecosystem Services** is full of great activities for upper primary school learners – adapt them to our Namibian context!

With secondary students, we can start discussing how we can add more value by putting a price on ecosystem services, as many of these are not accounted for in the price of products - known as environmental externalities. We can also use real data in our accounting classes, e.g. the school's water and electricity bills – this can be part of our school's environmental audit (see **Toolkit 3.3**). Also, together with our secondary school learners, we can learn more about the **green economy**.



GREEN ECONOMY

"The United Nations Environment Programme (UNEP) defines a green economy as 'one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.' It is an economy that is low-carbon, resource efficient and socially inclusive."

UNESCO & UNEP, 2016



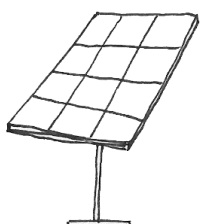
Read or print out Chapter 11 "Money and jobs, linking them with biodiversity" on **pg. 41 - 44** in UNESCO's **YouthXchange - Biodiversity and Lifestyles Guidebook**.



Learn with your secondary students about concepts such as the 'green economy' from UNESCO's **YouthXchange - Green Skills and Lifestyle Guidebook**.

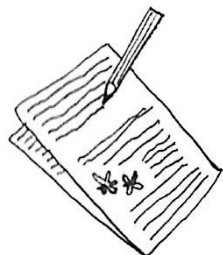


The activity described on **pgs. 50 - 58** in **Environmental Education Trainers Guide for Nature Conservation** explores how economics, consumerism and the environment are connected – do this activity with your secondary school learners.



LANGUAGES

Whether we are teaching a first, second or a foreign language, we can easily bring nature into our lessons, at any phase level! Incorporate nature into the following activities:



- spelling bees
- writing & reading poems
- oral presentations & debates
- comprehension & reading exercises
- argumentative or descriptive essays
- narrative essays & short stories

Prompt your learners to write a short story about living in a sustainable future...

Refer back to **Toolkit 1** and **Toolkit 3.1 – Teach an ESD Lesson Plan** for ideas on content.

SOCIAL STUDIES (HISTORY & GEOGRAPHY)

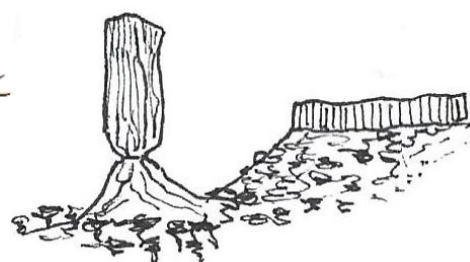
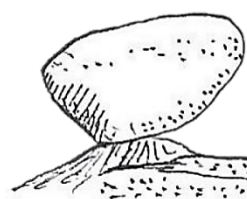
In our social studies or history lessons we can celebrate nature by exploring how different cultures across the world and through time viewed nature, and what role it played in their belief systems, their art and food. Namibia has several sites with rock art made by indigenous people long ago, many of which depict animals and plants that depict or symbolise Namibian animals and plants.



Geography lends itself to teach in more depth about our physical landscapes and climatic regions. Namibia is often referred to as a geologist's dream. Because most of our country is sparsely vegetated, one can clearly see the geological formations. So, we can use Namibian examples to teach about weathering processes, different types of rocks, river systems, types of rainfall, nutrient cycling, etc.



For more theory and examples of Namibia's geology and climate go back to *Environmental Awareness for Sustainable Development* and the *Atlas of Namibia* in **Toolkit 1.1 – Know Namibia's Environment**. Also see the resource *Teaching Resource Kit for Dryland Countries* in **Toolkit 3.8**.



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1. AN ENVIRONMENTAL DAY

WESSA 2021 Environmental Days Calendar



CALENDAR: This planner shows the major international and Africa-specific environmental days. It includes a reference system where the environmental day is linked to the corresponding and relevant SDG.

AUTHOR: WESSA (2021)

Link: <https://wessa.org.za/wp-content/uploads/2020/11/2021-Environmental-Days.png>

Giraffe Conservation Foundation Resources



BOOKLET & ACTIVITY BOOK: *Africa's Giraffe: A Conservation Guide* booklet educates on giraffe conservation efforts. The *Nature Workbook* is an educational activity book on nature for young children, including educational material.

AUTHOR: Giraffe Conservation Foundation (2016 and 2021)

Africa's Giraffe: A Conservation Guide: <https://giraffeconservation.org/wp-content/uploads/2016/03/Africas-Giraffe-A-conservation-guide.pdf>

Nature Workbook Part 1: <https://giraffeconservation.org/wp-content/uploads/2021/04/GCF-Nature-Workbook-LR-pages-1-32.pdf>

Nature Workbook Part 2: <https://giraffeconservation.org/wp-content/uploads/2021/04/GCF-Nature-Workbook-LR-pages-33-68.pdf>

EHRA Educational Resources



BOOKLET & ACTIVITY BOOK: Designed to be used with different age groups, these educational resources form EHRA cover species knowledge, elephant-human conflict and elephant protection. It also gives practical how-to information during elephant encounters.

AUTHOR: EHRA (2019 and 2020)

Community Elephant Conflict Mitigation Workshop:

<https://static1.squarespace.com/static/5cab5076797f7475f98c1b42/t/5d237c8f9813d80001e01c18/1562606748846/04+Community+Training+2.pdf>

Junior Elephant Guard Handout and Field Workbook:

<https://static1.squarespace.com/static/5cab5076797f7475f98c1b42/t/5feae8177ded4178ae93b33d/1609230426336/EHRA+Handout+Schools.pdf>

A Predator's Role in The Ecosystem



MANUAL: This teacher's guide initially shows the correlation between Namibian National Syllabi and teaching about predators, and then provides lesson plans, activities and the corresponding material.

AUTHOR: Cheetah Conservation Fund (2016)

Link: <https://cheetah.org/wp-content/uploads/2019/09/CCF-Teachers-Resource-Guide-4th-Edition.pdf>

World Rhino Day Lesson Plan



LESSON PLAN: Developed to increase knowledge and awareness for rhinos, this resource is a three-stage lesson plan on why rhinos are endangered. It includes material, a vocab list and educational information.

AUTHOR: Children in the Wilderness (2017)

Link: <http://www.childreninthewilderness.com/wp-content/uploads/2017/09/World-Rhino-Day-2017.pdf>

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Wetlands of Namibia



BOOKLET: This booklet informs on what wetlands are, the state of wetlands and types of wetlands in Namibia, and the role they play as a natural resource. It also explores pressures on the wetlands and management thereof.

AUTHOR: S. Bethune, D. Shaw, K. Roberts and Wetland Working Group of Namibia (2004)

World Ocean Day for Schools 2020



VIDEO: This video introduces the celebration of World Ocean Day for Schools, explaining what it is, the motivation behind the initiative, and shows how it is celebrated around the world including ideas for schools.

AUTHOR: World Ocean Day for Schools (2020)

Link: <https://www.youtube.com/watch?v=q8-LY5H06hw>

Increasing Ocean Literacy



MANUAL: This activity guide is for organizing an event for World Ocean Day. It includes documents that inform activities relating to marine litter and plastic pollution, as well as material for suggested activities.

AUTHOR: E. Atger, World Ocean Network (2020)

Link: <https://www.seachangeproject.eu/ouroceanourhealth/ocean-literacy-resources/world-ocean-day-activity-guide>

World Environment Day 2021



VIDEO: This animated video gives the history to World Environment Day, explaining impacts the day has had. It then outlines the context and aims of the 2021's theme of Ecosystem Restoration.

AUTHOR: The Assorted Bag (2021)

Link: <https://www.youtube.com/watch?v=4PvGNzi1dnY>

#itsup2us to make a better Namibia



VIDEO: Local artist, EES, challenges Namibia to participate in a clean-up of the country and gives ideas how to do this, including a challenge that the national budget be more focused on this issue.

AUTHOR: EES (2018)

Link: https://www.youtube.com/watch?v=d_2D9mEjqB0

2. USE THE ARTS

Art-based Environmental Education (AEE) Manual



MANUAL: This manual outlines the concept of art-based environmental education, explaining the concept and how to apply this knowledge to the art-based subjects. It also contains lesson plans and activity ideas.

AUTHOR: EduVentures (2019)

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Recycled Arts and Crafts Guide



MANUAL: This guide for teachers gives instructions for conducting arts and crafts projects out of recycled materials, and includes guidance on educating children about recycling through engaging with the activities.

AUTHOR: Schools Recycle, Planet Ark (n.d)

Link: https://slco.org/globalassets/1-site-files/recycle/teacher_resources/recycledartsandcraftsguide.pdf

It Costs Almost Nothing



MANUAL: Following some background information, this book gives step-by-step instructions for creating various toys and games from rubbish and recycled materials for young children.

AUTHOR: M. Gallagher, M. Harlech-Jones (2007)

Link: https://www.rightstart.com.na/wp-content/uploads/2019/12/It-costs-almost-nothing-book-reduced_compressed.pdf

Environmental Studies – Magic with Music



ARTICLE: This resource is comprised of case studies where schools have taught environmental topics through using music in various ways. Through examples, it guides on how to use music as a teaching tool in EE.

AUTHOR: L. Borradaile (2000)

Link: http://assets.wwf.org.uk/downloads/magic_with_music.pdf

Samalilani 'Preserve'- Zambian Music for Earth



VIDEO: This video is the result of a culmination of Zambian artists and the Conservation Music movement: a collaborative song to convey the message of needing to protect and live in harmony with our environment.

AUTHOR: Conservation Music (2018)

Link: <https://www.youtube.com/watch?v=q9F9LEEOUGE>

Green Poetry



LESSON PLAN: With examples and links to further inspiration, this resource gives instructions for nature-inspired poetry writing and guidance on how to do so, including writing different types of poems.

AUTHOR: Forest Preserves of Cook County (2020)

Link: <https://fpdcc.com/wp-content/uploads/2020/05/FPCC-Earth-Day-Poetry-2020-050720.pdf>

Rain Must Fall – #breakingballet



VIDEO: Playing on the phrase 'breaking news' from news reporting, #breakingballet presents the Western Cape (South Africa) drought crisis by using ballet as a means of communication to raise awareness and publicity on the situation.

AUTHOR: Joburg Ballet (2017)

Link: <https://www.youtube.com/watch?v=xqiQ5csBtFg>

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Dance Factory Swakopmund presents "Lily"

VIDEO: This performance by Swakopmund's Dance Factory, "Lily" is a story that conveys the causes and effects of environmental pollution, highlighting its impact, suggesting solutions and raising awareness.

AUTHOR: Dance Factory Swakopmund (2018)

Link: <https://www.youtube.com/watch?v=BDFgRLgvEvc>

Save the Lofty Trees

LESSON PLAN: This environmental play script, including a musical score, is themed on saving trees from felling for industrial use. It covers deforestation, sustainable practice and human impact on the environment.

AUTHOR: L. Mills (2005)

Link: https://americanenglish.state.gov/files/ae/resource_files/05-43-1-h.pdf

Andy Goldsworthy Videos

VIDEO: These videos aim to inspire nature-based art. The videos show how to create these natural art pieces and explain the concept, the creator and its use as an educational tool.

AUTHOR: S. Marcus (2020), Library Arts Centre (2020)

Outdoor Art with Andy Goldsworthy: <https://www.youtube.com/watch?v=sIVTVGz6UXQ>

Andy Goldsworthy-inspired Nature Art: <https://www.youtube.com/watch?v=f6i5cxbm6ac>

Nature Inspired Arts and Crafts

PRESENTATION: Presenting various schools nature inspired arts/crafts projects, each project includes a visual and step-by-step guide on how the project was created, and tips from teachers who carried out the projects.

AUTHOR: Planet Ark (2015)

Link: <https://treeday.planetark.org/documents/doc-1369-2015-schools-tree-day-nature-craft-book.pdf>

3. TEACH ABOUT NATURE

Teacher's Training Manual - Biodiversity

MANUAL: This teacher's manual covers the theory behind EE and ESD, before educating on the topic of biodiversity, including ecosystem services. It also contains related activity ideas for the classroom.

AUTHOR: EduVentures (2020)

It's Time to Grow: Animals and Plants

ACTIVITY BOOK: Aimed at young children, this educational booklet (in 6 Namibian languages) focusses on animals and plants, and their interaction. It uses age-appropriate activities for junior primary school.

AUTHOR: V. Keding (2019)

Link: <https://nadeet.org/its-time-to-series>

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PAKO Kids Magazine



ACTIVITY BOOK and WEBSITE: A local children's educational magazine on nature and animals, issues include activities, information and tips. The website links to all issues, and educational materials.

AUTHOR: PAKO

Link: <http://pako4kids.com/cleverkids/pakos.htm>

Environmental Education Activities for Primary Schools



MANUAL: A collection of activities for primary school level, to be integrated into an environmental education programme. The list of ideas suggested specifically use low cost equipment and easily accessible materials.

AUTHOR: UNESCO, International Centre for Conservation Education (1992)

Link: <https://unesdoc.unesco.org/ark:/48223/pf0000096345>

Human and Animal Study Manual for Grade 4-6



MANUAL: This educational resource for teachers, is written as an easy-to-understand guide on teaching the connection between humans and animals. It includes subject information, teaching methods and activities.

AUTHOR: C. Van Alphen (2012)

Link: https://www.zukunftsstiftung-entwicklung.de/media/Bilder_ZSE/UEber_Uns_Dateien/Grundlagentexte/Human_and_Animal_Study_Manual_2012.pdf

Plant Study Manual



MANUAL: This booklet created to inform teachers with theoretical knowledge and suggestions of how to teach the subject of 'plants' as per Waldorf Education principals. The manual can also be used with learners.

AUTHOR: C. Van Alphen

Link: https://www.zukunftsstiftung-entwicklung.de/media/Bilder_ZSE/UEber_Uns_Dateien/Grundlagentexte/PLANT_STUDY_MANUAL.pdf

STEM Learning through Science-based Nature Journaling (for Middle and High School Teachers)



MANUAL: This teacher guide on nature journaling and how to go about it introduces the concept before it explains the process, explores tools, techniques, class discussion and project ideas, and means of evaluation.

AUTHOR: K. Brandes (2014)

Link: https://issuu.com/nurturenaturecenter/docs/building_teacher_s_notebook

Nature Journal Ideas



PRESENTATION: An instructional presentation on how to approach nature journaling, what it is and tips for how to make a nature journal. It includes visual prompts and examples, as well as ideas for journaling entries.

AUTHOR: My Woodlot (n.d)

Link: http://www.mywoodlot.com/images/supporting_information/nature_journal_ideas.pdf

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UNESCO Biodiversity Learning Kit – Volume 2, Activities



MANUAL: This collection of activities on the various aspects of biodiversity, forms an educational kit for interdisciplinary teaching on the topic; including step-by-step teacher guidance and projected activity outcomes

AUTHOR: UNESCO (2017)

Link: <https://unesdoc.unesco.org/ark:/48223/pf0000245982>

Biodiversity Challenge Badge and Resource Materials



BOOKLET and MANUAL: A part of the Challenge Badge series, this educational material on the subject of biodiversity is for young people (*Biodiversity Challenge Badge*) and there is a corresponding teacher's guide (*Biodiversity Challenge Badge Resource and Activity Materials*) to supplement teaching on the subject.

AUTHOR: Food and Agriculture Organisation of the United Nations (2010)

Biodiversity Challenge Badge: <http://www.fao.org/3/i1885e/i1885e.pdf>

Resource and Activity Materials: <http://www.fao.org/3/ax742e/ax742e.pdf>

Fibonacci Videos



VIDEO: These videos show the presence of the Fibonacci sequence in nature, and other numeracy examples that occur in the natural world. Both illustrate and explain the presence of math and science in nature.

AUTHOR: Etérea Studios (2010), Vihart (2012)

Nature by Numbers: <https://www.youtube.com/watch?v=kkGeOWYOFoA>

Spirals, Fibonacci and Being a Plant: https://www.youtube.com/watch?v=IOIP_Z_-0Hs

Biomimicry Videos



VIDEO: These videos illustrate how nature's designs can provide an example for the human built world to imitate in design and practice. They include examples of biomimicry techniques, explaining this principle.

AUTHOR: Vox (2017), Sustainably Illustrated (2020)

The World is Poorly Designed but Copying Nature Helps: <https://www.youtube.com/watch?v=iMtXqTmfta0>

5 Amazing Biomimicry Examples: <https://www.youtube.com/watch?v=5FZ9Ryx5zAk>

Sharing Biomimicry with Young People – An Introduction for K-12 Educators



MANUAL: This guidebook aims to inform teaching a foundational understanding of biomimicry. It includes resource material and suggestions for introducing the topic and way of problem solving to learners.

AUTHOR: Biomimicry Institute (2017)

Link: <https://asknature.org/resource/sharing-biomimicry-with-young-people/>

RESOURCES

SOURCE KEY

Hardcopy



Softcopy



Online



Inspiration from Nature – Science, Design and Technology



MANUAL: Acknowledging the role of nature in inspiring and informing science, design and technology, this teacher's guidebook gives activities and resource sheets for learning from and about nature and biomimicry.

AUTHOR: WWF (2020)

Link: https://www.wwf.org.uk/sites/default/files/2020-01/WWF-Biomimicry-Handbook_Activities.pdf

Techniques from Nature



LESSON PLAN: Exploring the concept of biomimicry, these lesson plans focus on design cycles, biomimicry understanding and using nature-based solutions to solve technical problems.

AUTHOR: P. Janssen, M. de Koning, M. Nijssen, B. Wijffels (2019)

Link: <https://biolearn.eu/wp-content/uploads/2019/10/Techniques-from-nature-Teachers-guide-year-8-11.pdf>

Nature's Services: A Guide for Primary School on Ecosystem Services



MANUAL: Beginning by explaining the concept ecosystem services, this booklet then guides on best practice to teaching the topic, including objective suggestions, activities and evaluation methods.

AUTHOR: P. Wiborn (2013)

Link: <https://www.wwf.se/dokument/natures-services-a-guide-for-primary-school-on-ecosystem-services/>

YouthXchange Resources



BOOKLET: Aimed at ages 15-24, these resources (*Biodiversity and Lifestyles Guidebook* and *Green Skills and Lifestyle Guidebook*), contain educational material to build knowledge on biodiversity and greening application, and guide on the corresponding practical life skills that protect and sustain the planet.

AUTHOR: UNESCO, UNEP (2015 and 2016)

Biodiversity and Lifestyles Guidebook: <https://www.unep.org/resources/publication/youthxchange-guidebook-series-biodiversity-and-lifestyles>

Green Skills and Lifestyles Guidebook: <https://www.unep.org/resources/publication/youth-xchange-green-skills-and-lifestyles-guidebook>

Environmental Education Trainers Guide for Nature Conservation



MANUAL: Directed at environmental educators, this guide gives information and correlating activities to build an educator's knowledge and understanding of EE with a focus on conservation.

AUTHOR: M. Matarasso, N. Viet Dung (2002)

Link: https://wwf.panda.org/wwf_news/?88780/Environmental-Education-Trainers-Guide-to-Nature-Conservation

Rock Art: A Cultural Treasure at Risk



BOOK: This book informs on the protection of the heritage of rock art. It includes information and foundational protection and preservation principles.

AUTHOR: N. Agnew, J. Deacon, N. Hall, T. Little, S. Sullivan, P. Taçon (2015)

Link: https://www.getty.edu/conservation/publications_resources/pdf_publications/pdf/rock_art_cultural_treasure.pdf