

CHALLENGE BADGE SERIES SPONSORED BY

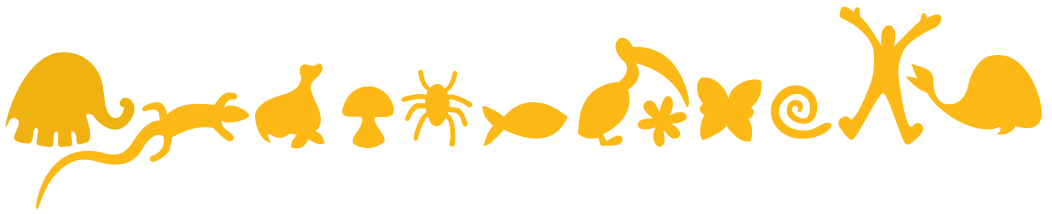


Biodiversity Challenge Badge



THE GREEN WAVE

Biodiversity Challenge Badge



The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

All rights reserved. Reproduction and dissemination of material in this information product for educational or other non-commercial purposes are authorized without any prior written permission from the copyright holders provided the source is fully acknowledged. Reproduction of material in this information product for resale or other commercial purposes is prohibited without written permission of the copyright holders.

Applications for such permission should be addressed to:

Chief

Electronic Publishing Policy and Support Branch

Communication Division

FAO

Viale delle Terme di Caracalla, 00153 Rome, Italy

or by e-mail to:

copyright@fao.org

© FAO, WAGGGS and CBD November 2010



This document has been financed by the Swedish International Development Cooperation Agency, Sida. Sida does not necessarily share the views expressed in this material. Responsibility for its content rests entirely with the author.



An International Year of Biodiversity product.

table of contents

4	INTRODUCTION
4	A WARM WELCOME TO CHILDREN AND YOUNG PEOPLE
6	INFORMATION FOR TEACHERS AND LEADERS
6	Introduction to biodiversity
10	Young people and biodiversity
11	About the badge
12	The badge curriculum
13	Age ranges of activities
14	How to use this badge curriculum - <i>guidelines for teachers and leaders</i>
16	Sample curriculum
17	Be safe and sound
18	Additional information and resources
19	Illustrations and badge design



20	OUR AIR [section A]
22	Up in the air
26	Biodiversity is linked to a healthy planet



30	OUR WATER [section B]
32	Protect your watershed
35	Think downstream
37	All species need water



40	OUR LAND [section C]
42	Biodiversity on the menu
44	Gardening for goods
47	Protect habitats



52	OUR WORLD [section D]
54	Discover!
57	Be creative!
59	Reach out!
60	Take action!

62	RESOURCES AND ADDITIONAL INFORMATION
64	USEFUL WEBSITES AND BOOKS
66	GLOSSARY
68	ACKNOWLEDGEMENTS

A warm **welcome** *to* **children** *and* **young people**

Throughout the 100 years of Girl Guiding and Girl Scouting, girls and young women have been caring for and advocating for the protection and preservation of the environment and the life it sustains. At the heart of the Movement is respect for nature, a respect that unfortunately is lacking in many areas, with animal extinctions on the rise, deforestation increasing and habitat loss growing.

Now, more than ever, we need to continue and accelerate the Guide and Scout tradition of leaving the world a better place than we found it. Already, young people are leading the way in protecting and sustaining biodiversity. They are planting trees, lobbying governments, recycling waste and raising awareness about pollution.

We hope this resource supports you to continue to be powerful influences in your own futures and in the sustainability of your communities and environments.

Margaret Treloar

Chairman, World Association of Girl Guides and Girl Scouts

Biodiversity is the foundation of healthy ecosystems that create an environment we can live in, ensuring clean air, water and fertile soils that can feed us all. For thousands of years humans have developed new varieties of crops and breeds of animals using the diversity of life around them and still now many of these crops need the help of other organisms to grow – for example bees pollinate many types of fruit trees. I hope the Biodiversity Challenge Badge develops your curiosity in the wonders of nature, encourages you to learn more, and drives you to take action to preserve the environment that is around you.

Peter Holmgren

Director, Climate, Energy and Tenure Division, FAO

Biodiversity is life. Biodiversity is our life. That's the simple message of the 2010 International Year of Biodiversity. The variety and complexity of life is astounding. In recent history, humankind has been very careless; the result is that we are losing biodiversity and the benefits it brings.

The things we do now to protect or destroy nature will shape the world we live in tomorrow. The biodiversity challenges of the future will be met by today's children and young people – the citizens and leaders of tomorrow. I encourage you to learn and teach others about biodiversity through the Biodiversity Challenge Badge. It is your creativity, curiosity and persistence that will ultimately ensure life in harmony, into the future.

Ahmed Djoghlaif

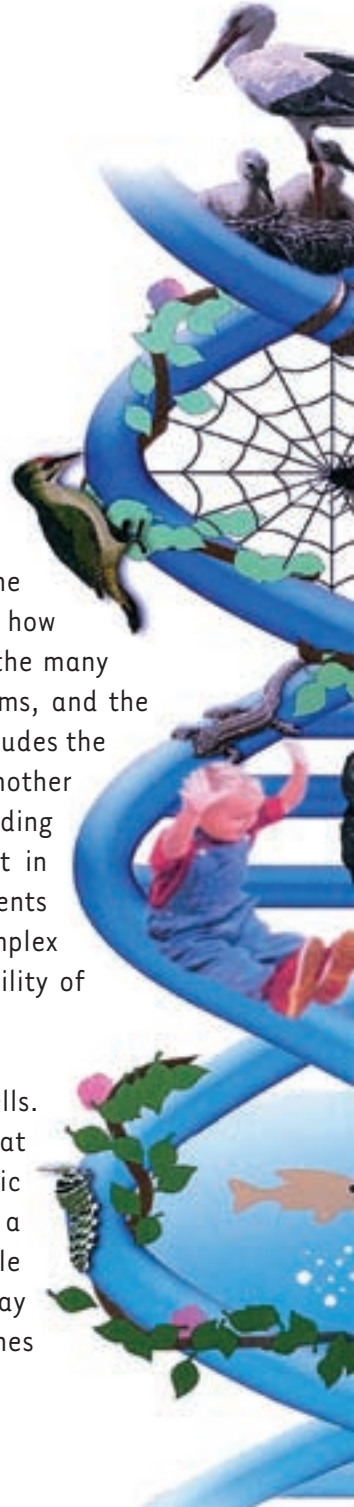
Executive Secretary of the Convention on Biological Diversity

Information *for* teachers *and* leaders

Introduction to biodiversity

'Bio' means life and 'diversity' means variety, so biodiversity (or biological diversity) is the incredible variety of living things in nature and how they interact with each other. It consists of all the many species of animals and plants and other life forms, and the variety that exists within each species. It also includes the diversity present in ecosystems - or explained another way - the variation we see in the environment including landscapes, the vegetation and animals present in it, and the various ways in which these components interact with each other. Biodiversity is very complex and is often explained as the variety and variability of genes, species and ecosystems.

Genes are the units of heredity found in all cells. They contain special codes or instructions that give organisms different characteristics. Genetic diversity occurs within a species and even within a variety of a given species. For instance, in a single variety of tomato, the genes of one individual may cause it to flower earlier than others, while the genes



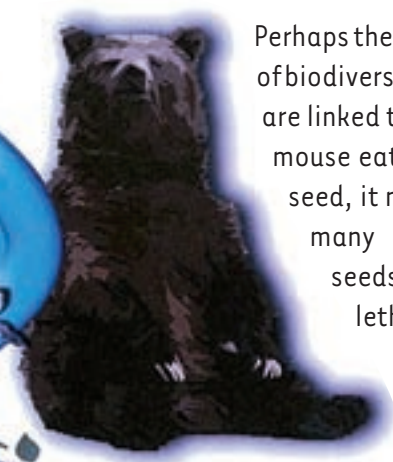
of another individual may cause it to produce redder tomatoes than other plants. Genetic diversity is at the individual level, and makes everyone unique. So in fact no two living things in nature are exactly the same.

In our world you can find a dazzling array of animals, plants, fungi and microorganisms, all these different kinds of organisms are called species. A species is a group of similar organisms that can breed together and produce healthy, fertile offspring. Although we may not think about it, we see various species as we go about our daily lives, such as humans, goats, trees and mosquitoes. Species diversity is the most obvious type of biodiversity. Our planet supports millions of species, many of which are not yet identified!

Animals, plants and even microorganisms live in communities just like humans do. Where communities of plants and animals live together, and share their space, their land and their climate, they form an ecosystem. Ecosystems are what many people call “the environment” or “nature”. There are many kinds of ecosystems on Earth. Ecosystems can be small like puddles, or large like deserts, forests, wetlands, mountains, oceans, lakes and rivers.

Perhaps the most important characteristic of biodiversity is that all of the components are linked to each other. For example, if a mouse eats a chemically-contaminated seed, it may survive, but if a hawk eats many mice that have eaten such seeds, the hawk may die from a lethal dose of the chemical.

Ayhan Koyun, aged 16, Turkey



Biodiversity linkages can also be beneficial: the restoration of coastal mangroves forest ecosystems provides important nursery home for fish and other marine species, improves fisheries along the coastline, and protects human settlements from extreme weather events.

Not only does biodiversity exist, it also has a function or purpose. Ecosystems provide things that humans benefit from and depend on. These things are called ecosystem goods and services. Ecosystem goods and services include all the natural resources and processes that maintain the conditions for life on Earth.

For example, biodiversity provides us with the food we eat, cleans the air we breathe, filters the water we drink, supplies the raw materials we use to construct our homes and businesses, is part of countless medicines and natural remedies, and many other things. It helps regulate water levels and helps to prevent flooding. It breaks down wastes and recycles nutrients, which is very important for growing food. It protects us with *natural insurance* against future unknown conditions brought about by climate change or other events. For example, native plants in some temperate countries must withstand hot summers and cold winters, and may have genetic material that could be used to develop agricultural crops that can endure very large temperature ranges. Another important ecosystem service is the cultural value of natural landscapes to people's livelihoods, religious beliefs and leisure activities. Many people, such as farmers, fishers, biologists and ecotourism operators, depend on biodiversity for their livelihoods.

The importance of biodiversity goes beyond its value to human beings: all animals, birds, insects, plants, microorganisms, fungi and other creatures have the right to exist. Unfortunately, all is not well for the planet's biodiversity: biodiversity loss is occurring at an unprecedented rate. Unless we take action, we risk destroying nature's rich diversity forever. But what can be done?

The biodiversity challenge badge aims to help young people answer this question. It is designed to raise awareness on biodiversity issues among children and young people and to provide them with knowledge that can help them become active agents of change in our society. By carrying out these activities your group will identify and take responsible actions in your communities, and therefore, strengthen your participation in the protection, preservation and improvement of our natural resources.

Introduction



Participant's name: Sine Hwang
Participant's SURNAME: Hwang
Country: Korea
Age: 15 Date of birth (mm/dd/yyyy): _____
E-mail address: _____

Young people and biodiversity

Many current and anticipated challenges are linked to biodiversity. While many of the problems must be addressed at the global level, there are many things that can be done by individuals and groups in their communities. These steps start with gaining an appreciation and respect for biodiversity and progress to taking concrete action.

Children and young people are eager to shape a more positive future. They are creative, thoughtful and capable citizens whose enthusiasm, fresh approaches and boundless energy can fuel innovative solutions at local and international levels alike. Young people's embracing of learning and new technologies puts them in a position to act as convincing communicators. The involvement of young people in biodiversity is critical to finding lasting solutions to our world's biodiversity challenges.



Eva Bartoleschi, aged 8, Italy

About the badge

This biodiversity challenge badge is a tool to allow teachers and youth leaders to guide young people in learning about biodiversity and developing action-oriented projects.

Age-appropriate activities introduce biodiversity concepts and stimulate exploration through action-based learning. They encourage participants to get to know the natural world in their community, to find out why certain species and habitats are struggling to survive, and to understand the links between biodiversity and the well-being of people around the world. The badge activities help young people gain knowledge, skills and values to protect, preserve and improve biodiversity.

The badge is jointly produced by the Food and Agriculture Organization of the United Nations (FAO), the Secretariat of the Convention on Biological Diversity (CBD) and the World Association of Girl Guides and Girls Scouts (WAGGGS), through the Youth and United Nations Global Alliance (YUNGA) and *The Green Wave*. These organizations are committed to addressing biodiversity challenges and to helping young people participate in protecting, preserving and improving biodiversity in their communities.

This badge is the second in a series of badges jointly produced by YUNGA. Other challenge badges, including the Climate Change and Food Security Challenge Badge, are available at www.yunga.org

Additional resources, including *The Youth Guide to Biodiversity*, support this badge. For additional details, see the back of this booklet.

The badge curriculum

The badge curriculum is divided into four categories. To make it easier to find the activities in the booklet the following labelling system has been used.



To earn the badge, participants must complete two activities from each category. The first or second activity listed in each category must be completed by everyone as it provides an overview to the topics. These compulsory activities are best done in a group. Individuals can then choose from the list of optional activities the ones that are most relevant and interesting to them.

This badge has lots of different kinds of activities to appeal to young people all around the world, surrounded by lots of different forms of biodiversity, and with different levels of access to resources and technologies. Not all activities will be possible in all parts of the world: it's hard to explore tidal pools when you're far from the ocean, or to play online biodiversity games when you don't have a high-speed internet connection. Be sure to choose activities that are relevant and can be done in your area.

Age ranges of activities

To help you and your group select the most appropriate activity a coding system is provided to indicate the age group for which the activity is most suitable.

Next to each activity you will see a code, for example 'Levels 1 and 2,' which indicates the activity should be suitable for five to ten year olds and eleven to fifteen year olds. Please note that this coding is only indicative.

You may find that an activity listed at one level is suitable for another level in your area.

- LEVEL **1** **FIVE TO TEN** years old
Participants will learn about different species and ecosystems in their neighbourhoods.
- LEVEL **2** **ELEVEN TO FIFTEEN** years old
Participants will learn how to describe the different components of biodiversity and ecosystem services, and be able to give examples in their surroundings.
- LEVEL **3** **SIXTEEN TO TWENTY** years old
Participants will gain a more in-depth understanding of biodiversity components, ecosystem services and of the work going on at the international level.

How to use this badge curriculum

- guidelines for teachers and leaders

Step 1

Encourage your group to learn about biodiversity. We recommend you begin by introducing the concept of biodiversity with Activity D.01 in the Our World section. Before doing other activities, make sure everyone understands the three levels of biodiversity - genes, species and ecosystems - and that they are all interlinked. From there, take the learning outside! Visit your local botanic gardens, neighbourhood library, or natural history museum, invite a scientist to talk with your group, look online or explore the outdoors. Resources such as the *Youth Guide to Biodiversity*, The Green Wave website (greenwave.cbd.int) and the other resources listed at the end of this booklet are great places to look.



Step 2

Let the group and the individual members choose which activities they want to do. There are a few activities that everyone needs to complete because they provide the necessary background and understanding of the different topics. Apart from these activities, participants are encouraged to select the activities that best match their needs, interests and culture. Some activities can be done individually, others in small groups. If you have another activity that is especially appropriate for your group, you may also include it as one of the options.

Step 3

Allow enough time for the group to carry out the activities. Some activities, such as playing a biodiversity game or making animal masks, can be completed in one hour or less, while others, such as observing things decompose or growing a biodiversity garden, require some work over several weeks. It's helpful to first decide how you want to complete the badge (e.g. during your meeting or at camp) and then select appropriate activities that you can do. Support and guide them throughout the process but ensure they carry out their tasks as autonomously as possible. Many activities can be conducted in several different ways. Encourage participants to think and act creatively when undertaking their activities.

Step 4

Have participants present the results of the challenge badge to the rest of the group. Do you notice any changes in their attitudes and behaviour? Encourage participants to think about how the objects and activities in their everyday lives affect biodiversity. Discuss the experience and reflect on how they can continue to apply it in their lives.

Step 5

Organize an award ceremony for those who successfully complete the challenge badge. Invite families, friends, teachers, journalists and community leaders to participate in the ceremony. Encourage your group to be creative and present the results of their project to the community. Award them with certificates and challenge badges. Challenge badges can be ordered at the WAGGGS online shop: www.wagggs-shop.org

Step 6

Share with the FAO, CBD and WAGGGS! Send us your stories, photos, drawings, ideas and suggestions: children-youth@fao.org

Sample curriculum

The biodiversity challenge badge can be completed at a camp or over the course of several meetings or classroom sessions. Each child has to do 2 activities from each of the 4 sections (Our Air, Our water, Our Land and Our World). All you have to do is select the most appropriate activities for your group. Remember you can also develop new activities, you don't have to use the ones in this booklet. Provided below are examples of a camp and meeting based curriculum for the three different age groups.

At camp

Individuals aged Five to Ten (Level 1):

Individuals could do two biodiversity hikes such as activity A.02 (on page 21) and activity B.07 (on page 33). Carry out two activities such as A.11 (on page 26) and C.10 (on page 44), undertake two crafts such as B.01 (on page 31) and D.01 (on page 53) and do two activities such as C.01 (on page 41) and D.06 (on page 55) at the camp fire.

The other examples below just provide the codes for quick reference.

Individuals aged 11 to 15 (Level 2)

Hike (A.02), Games and activities (A.09, B.27, C.07, D.16), Crafts (B.01, D.01), Campfire activities (C.01)

Individuals aged 16 to 20 (Level 3)

Hike (A.02, A.11), Games and activities (B.02), Crafts (C.13, D.01), Campfire activities (C.01, B.24, D.18)

At meetings

Individuals aged Five to Ten (Level 1) :

Field trip (A.01), Games and experiments (B.13, C.11, D.19), Crafts (A.06, B.01, D.01), Guest speaker (C.01)

Individuals aged 11 to 15 (Level 2):

Field trip (A.01, C.31), Games and activities (A.07, B.05, C.12), Crafts (B.01, D.01), Guest speaker (C.01, D.07)

Individuals aged 16 to 20 (level 3):

Field trip (A.01, B.02, C.09), Games and activities (A.17, D.20), Crafts (C.13, D.01), Guest speaker (C.01, B.20)



Be safe and sound

Exploring the natural world is a fantastic way to learn about nature, however it is important to take some precautions to ensure nobody gets hurt. Remind your group of the following guidelines described in *Eco-fun: great projects, experiments and games for a greener Earth* by David Suzuki and Kathy Vanderlinden.

Protect yourself

- >> Be careful when using sharp objects and electrical appliances. Young children should seek the help of an adult.
- >> Don't look directly at the sun.
- >> Don't taste things you find unless you are certain they are not poisonous.
- >> Wear gardening or rubber gloves when handling soil.
- >> Wash your hands after finishing an activity.
- >> In some activities, you have the option of uploading pictures or videos to the internet on websites such as YouTube. Always make sure you have the permission of everyone in the pictures or video, and their parents, before you post anything online.

Protect the natural world

- >> Treat nature with respect.
- >> Be careful with the animals you work with; wear protection if necessary. Be gentle. Make sure they have appropriate food, water and air. When you're done, put them back where you found them.
- >> Never pick protected species. Before collecting plants or picking flowers, get permission. Only take what you need and make sure you leave at least one third of anything you find in the wild. If possible it is best to not pick anything and to leave everything as you found it.
- >> When you do activities, especially the outdoor ones, make sure you *leave no trace*.
- >> As much as possible, recycle or reuse the materials used in the activities.

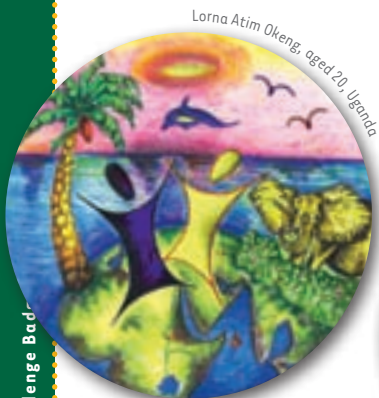
Additional information and resources

At the end of this booklet, there is a list of useful links to resources and activity materials which may help your group carry out the badge activities (pages 62 to 67). If you join our free e-mail list (see the news box below) you will automatically be informed when new resources become available.

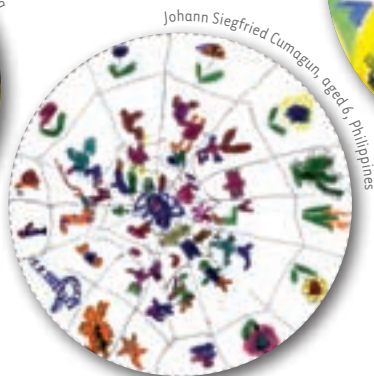
NEWS

This badge is one of several complementary resources and activities developed by FAO, CBD, WAGGGS, YUNGA and other partners. We would appreciate if you shared news and photos on how your group did the challenge badge, especially if you came up with novel ideas and activities. Please send your materials to: children-youth@fao.org

TO SAVE PAPER WE SUGGEST THAT YOU USE ONLY ONE COPY OF THIS DOCUMENT AND SHARE IT WITH YOUR SCHOOL AND GROUP



Lorna Atim Okeng, aged 20, Uganda



Johann Siegfried Cumagun, aged 6, Philippines



Fathmath Shiyana, aged 16, Maldives

Illustrations and badge design

The illustrations used in this booklets are a selection from the over 3000 drawings which were submitted to the International Biodiversity Art Competition.

The badge design, although not derived from a specific drawing, took inspiration from the many drawings submitted.

To see other drawing from this and previous competitions visit the following sites: www.yunga.org
www.yunga.org/scans/gallery_en.asp

This Challenge Badge is part of a series of challenge badges being developed by YUNGA.

Badges have or will be developed on Climate Change, Forests, Fish and Hunger and other themes.

To see existing badges go to:

www.fao.org/climatechange/youth/63380/en
and www.yunga.org



Our Air

section A

DO EITHER A.01 OR A.02 AND ONE OTHER ACTIVITY OF YOUR CHOICE. AFTER COMPLETING OUR **AIR** ACTIVITIES YOU WILL BE ABLE TO:

- >> **KNOW** and appreciate the species in your neighbourhood that live in the air
- >> **OBSERVE** and learn about biodiversity by exploring the nature around you

LEVEL 1 2 3

ACTIVITY
A.01

Explore biodiversity that lives off the ground. Put a large piece of paper or a bed sheet under a low branch. Shake the branch. Watch what flies away when you shake the branch. Examine the things that fall off the branch, such as leaves, insects, mushrooms and plants. How do these creatures get up onto the branch? Why would these creatures live above the ground? How do these creatures interact with each other to find food and shelter? What other animals might visit the branch in search of food, shelter or even a nesting site? Discuss your answers with your group.

GROUP ACTIVITY

Our Air



Our Water



Our Land



Our World



LEVEL 1 2 3

ACTIVITY
A.02

Explore biodiversity that lives off the ground. Walk around your neighbourhood, with a pair of binoculars if possible. What do you see just above the ground in the bushes? What is living halfway up the trees or grasses? What is at the top of the canopy (tree tops)? Do you see leaves, insects, mushrooms and plants? What else? How do these creatures get up onto the branch? Why would these creatures live above the ground? How do these creatures interact with each other to find food and shelter? What other animals might visit the branch in search of food, shelter or even a nesting site? Discuss your answers with your group.

GROUP ACTIVITY

Up in the air

LEVEL 1 2 ▲

ACTIVITY A.03

Look around your home, school, garden or park. What travels in the air? What methods do animals use to fly or glide? How do plants (their seeds and pollen) travel by air? Draw or photograph two traits that allow animals and plants to move through the air.

LEVEL 1 2 ▲

ACTIVITY A.04

In fall and/or spring, visit a park or conservation area where bird-watching is possible. Which migrating bird species stopover there? Try to see them and listen to their songs. Create posters or drawings, or take photos for your school or home.

LEVEL 1 2 ▲

ACTIVITY A.05

Biodiversity is full of change – just think of a caterpillar who starts out its life crawling and feeding on leaves, and then changes into a butterfly! Look for butterflies and moths in a field, a forest or a garden. Draw three types (or species) that live near you. Where did you see them – on a flower, near water, next to animal droppings, flying in the forest canopy, ...? How big were they? What colours and patterns were on their wings? Were they easy or hard to find (e.g. were they camouflaged)? Share your answers with your teacher, leader or group.

LEVEL 1 2 3 ▲

ACTIVITY A.06

Make a bird feeder out of recycled materials. Find out what types of food different species of birds prefer (e.g. some like fruit, others like seeds). Choose food for birds that are indigenous (native) to your area. Place your bird feeder in a place where the birds will be safe from predators. Record the number and types of birds that visit your feeder for two weeks.

www.rspb.org.uk/Images/recycled_bird_feeder_tcm9-207420.pdf



LEVEL 1 2 3

ACTIVITY
A.07

Plant a 'nectar bar' for hungry bees, wasps and flies. Grow a garden with a mixture of flowering plants and shrubs. Choose plant species that flower at different times of the year to ensure a constant supply of food for your insect guests. You might want to plant your nectar bar away from entrances to buildings and busy walkways.

LEVEL 2

ACTIVITY
A.08

Mushroom seeds are called spores, and are often dispersed by the wind. Each species of mushroom has a unique spore print (like a fingerprint). Collect three different mushroom species and make a spore print of each. For more information on making spore prints: www.mushroomexpert.com/spore_print.html or www.rspb.org.uk/Images/sporeprint_tcm9-202043.pdf

BE VERY CAREFUL, DO NOT USE POISONOUS MUSHROOMS, GET EXPERT HELP. DON'T FORGET TO WASH YOUR HANDS WHEN YOU HAVE FINISHED.

Denisa Valentina Huma, aged 10, Romania



Alia Safira, aged 11, Indonesia



LEVEL

2 3

ACTIVITY
A.09

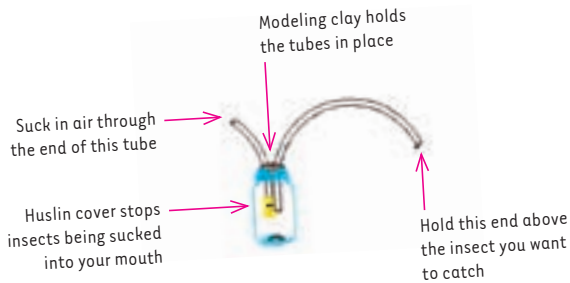
Insects have many special traits that allow them to live under all sorts of conditions in different habitats around the world. Catch insects in a pitfall trap, sweepnet or pooter (a special collecting bottle to catch insects or crustaceans by sucking through a tube). Make an insect field guide of the different species you collected. Release the insects. If possible, invite an insect specialist (entomologist) to join you. For tips on making a pooter:

www.amentsoc.org/bug-club/fun/experiment-pooter.html
and a sweep net:

www.rspb.org.uk/Images/Make_a_sweep_net_tcm9-195580.pdf.

GROUP ACTIVITY

HOW TO MAKE A POOTER



DON'T FORGET TO PROTECT YOURSELF, ESPECIALLY WHEN HANDLING INSECTS THAT BITE OR STING! YOUNG PARTICIPANTS SHOULD ONLY TRY THIS ACTIVITY WITH ADULT SUPERVISION.

LEVEL  **ACTIVITY**
A.10

Many animals including mammals, fish and butterflies migrate. Draw the migratory routes of five different bird or insect species on a world map. How far do they travel? How long does the migration take? Where does the animal breed, stopover to rest or eat and overwinter? How do the animals not get lost? List some possible advantages and disadvantages of migrating. Why do some birds travel during winter to warmer places? Why can't they find food?

LEVEL  **ACTIVITY**
A.11

Participate in a citizen science project. A citizen science project is one in which people without any special scientific training go out in nature and collect scientific data, which are then used by scientists. BirdLife International runs a fantastic global citizen science project on birds called WorldBirds. Visit the youth link on the website for instructions on how to participate or download the guide.

www.worldbirds.org

GREAT ACTIVITY

LEVEL  **ACTIVITY**
A.12

Find out which bat species live in your area and what their habitat and food needs are. Make a bat box and set it in a suitable place. Over several weeks, observe it in the evening and into the night to see if bats move in. Record your observations. For building instructions visit

www.hww.ca/hww2.asp?id=323

or the Bat Conservation International website

www.batcon.org

Biodiversity for healthy planet

LEVEL 1 2 3

ACTIVITY A.13

Different animal species have different strategies for keeping warm or cool (such as growing thick fur coats in the winter and lighter coats in the summer), and for keeping dry or moist (such as having water-repellent feathers and living under a rotting log). Make a list of some bird, mammal, amphibian, reptile, fish and insect species. What strategies do these species use? Play a game about the animals and their strategies. (Older youth can invent and lead younger children in these games). Will these strategies work as the planet's climate changes? Why or why not?

GROUP ACTIVITY

LEVEL 1 2 3

ACTIVITY A.14

After they die, plants and animals provide food for tiny creatures called microorganisms. Even though the microorganisms are too small to observe directly, you can see clues of their presence when you make biogas. With adult help, put rotting organic matter such as dirt, plants and fruit and vegetable scraps into a plastic bottle. Stretch an un-inflated balloon over the opening of the bottle. Place the bottle near a heat source or in direct sun. What happens to the balloon over the next five to ten days? Why does this happen? Think of how useful microorganisms are in the world, and what would happen if they did not exist. For more biogas ideas visit

www.pge.com/microsite/safety_esw/ngsw/ngsw/basics/experiment2.html



Sofia Victoria Martinez, aged 9, Argentina

Hui Wing Chan, aged 17, China



Our Air

Our Water

Our Land

Our World

LEVEL 1 2 3

ACTIVITY
A.15

Go on an 'energy diet' for two weeks. Create a plan to reduce your energy consumption at home, when moving from one place to another and at school. Carry it out. How much energy does each action save? How does using less energy and fewer resources save biodiversity? Challenge your friends and family to try your plan.

LEVEL 1 2 3

ACTIVITY
A.16

As the climate changes, some species will have to move upwards (literally up a mountain) or towards the poles to stay in the same type of climate. What are some of the species in your area that might need to move to find cooler weather or wetter or drier conditions? What are some of the difficulties these species might have if they need to move? Draw what you think your environment will look like if these species move away.

LEVEL

2 3

ACTIVITY
A.17

Draw a map of your community. Include both natural features such as forests and rivers and human features such as buildings and roads. Identify the possible sources of pollution on your map. Remember, some pollution comes from a single source (like a pipe) while other pollution comes from many small sources (like runoff from land). How does the pollution affect biodiversity? On your map, draw arrows linking the pollution sources to the biodiversity they affect. What can be done to minimise pollution? Share your findings with your group.

LEVEL

2 3

ACTIVITY
A.18

Investigate the links between creatures that live in the air and the food we eat. Visit an apiary or invite a beekeeper to talk with your group. List the fruits, berries and vegetables that grow in your garden or around your school, parks and playgrounds that are pollinated by insects. Which insect species are the pollinators? Do these species pollinate wild non-food plant species? How healthy are pollinator populations in your community? What are the threats to insect pollinators in your community? Identify one thing you can do to help insect pollinators ... then do it!

GROUP ACTIVITY

LEVEL

2 3

ACTIVITY
A.19

Biodiversity can help to reduce the effects of climate change. Make an original video or poster showing, for example, how trees capture carbon dioxide from the air and store it. Upload your video to YouTube or present your poster to your group or school. Make sure you have the permission of everyone in the video, and their parents, before you post it.

LEVEL ACTIVITY
A.20

Emissions trading (or cap and trade as it is sometimes called) is a tool for reducing greenhouse gas emissions. It also impacts biodiversity. Learn about emissions trading and related programmes such as *Reducing Emissions from Deforestation and Forest Degradation in Developing Countries* (REDD). What programmes are already in place in your community? Who is affected by them? How are the world's poor affected by emissions trading? Present your findings to your group. For more information see www.forestclimatechange.org/simplyredd1.html and storyofstuff.com/capandtrade

LEVEL

Do any other activity approved by your teacher or leader.

Yae Chan Park, aged 12, Republic of Korea



Hana Richelle, aged 13, Philippines



Tomoe Ito, aged 20, Japan



Our ^{section B} Water

DO THE FIRST OR SECOND ACTIVITY IN THIS SECTION AND ONE OTHER ACTIVITY OF YOUR CHOICE. AFTER COMPLETING OUR **WATER** ACTIVITIES YOU WILL BE ABLE TO:

- >> **KNOW** and appreciate the species and ecosystems in your area that depend on water
- >> **TAKE** action to help raise awareness or to protect water-related biodiversity



SOME ACTIVITIES IN THIS SECTION REQUIRE PARTICIPANTS TO GO NEAR PONDS, LAKES, BEACHES, OCEANS OR OTHER WATER BODIES. BE SURE TO TAKE WATER SAFETY PRECAUTIONS AND TO DO THE ACTIVITIES UNDER QUALIFIED SUPERVISION.

LEVEL 1 2 3

**ACTIVITY
B.01**

Learn about your local watershed - an area of land that catches rain and snow, and drains into a larger body of water such as a marsh, stream, river, lake, ocean or groundwater. Make a model using soil, bark, rocks, papier-mâché or recycled materials of your watershed.

Don't forget to include all the inputs to the water including natural streams and runoff from farms or industrial areas. How do plants and trees on land fit into the watershed? How do land and water-based animals fit into the watershed? Explain how your model works to your leader, family, friends or group.

GROUP ACTIVITY

LEVEL

2 3

**ACTIVITY
B.02**

Learn about your local watershed - an area of land that catches rain and snow, and drains into a larger body of water such as a marsh, stream, river, lake, ocean or groundwater. Create a guided tour of your watershed.

Invite your family, friends or group to participate in the tour. Point out all the inputs to the water including natural streams and runoff from farms or industrial areas. Explain how plants and trees on land fit into the watershed. Explain how land and water-based animals fit into the watershed.

GROUP ACTIVITY

Our Air



Our Water



Our Land



Our World



Protect your watershed

LEVEL 1 2 ▲

ACTIVITY B.03

Draw a picture or take photos of two plants: one that lives on land and one that lives in water. Label the different parts of each plant (e.g. flower, stem, blade, holdfast). How are the plants similar? How are they different?

LEVEL 1 2 ▲

ACTIVITY B.04

Animals living in water have evolved different body adaptations (traits that help an animal survive and/or reproduce) to help them move in their environment. Compare different animals such as coral, zooplankton, flying fish, tuna, sharks, seals, orcas, sea horses, manatees, jellyfish and sea stars. What are some of their adaptations? How do these animals move? What are some examples of human inventions that copy sea animal movement? If possible, visit an aquarium to see sea creatures in action. Share your finding with your group.

LEVEL 1 2 3 ▲

ACTIVITY B.05

Make some puppets. Invent a puppet show that teaches people about the importance of healthy watershed and what they can do. Look outside to see how water runs in your environment and get your puppets to explain the differences between water running in a built environment (gutters, parking lots, etc.) and in natural systems. Make sure you observe the differences during rain and a few hours afterwards. Invite your family and friends to watch your puppet show. Older participants can perform their show for younger children.

GROUP ACTIVITY

LEVEL

2 3

ACTIVITY
B.06

Organize or participate in a beach clean-up. Monitor the progress of recovery. What can be done to make sure the area stays clean? If the beaches in your area are already clean, visit a beach once after a storm, then again at another time after the beach has 'cleaned' itself. What are the changes in the diversity of life along the beach and the shore? Discuss your findings with your group. **BE CAREFUL OF SHARP OR TOXIC ITEMS, USE APPROPRIATE PROTECTIVE EQUIPMENT, SUCH AS GLOVES.**

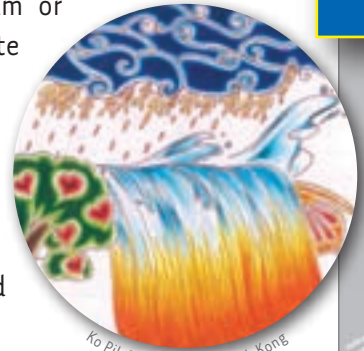
GROUP ACTIVITY

LEVEL

1 2 3

ACTIVITY
B.07

Explore a stream or pond. Examine the life inside. Take a water sample and examine it under a magnifying glass or microscope. Record what you see. Return the water and the creatures back to the stream or pond. Different species can tolerate different amounts of pollution. (If possible ask your local wildlife experts which species you would expect to find in clean water sources and polluted water sources in your area). How polluted is your stream or pond?



Ko Pik Sum, aged 17, Hong Kong

LEVEL

1 2 3

ACTIVITY
B.08

Build a hibernaculum (a place where animals hibernate) for amphibians. Don't forget that amphibians require humid environments, so the hibernaculum should be near water. Observe the animals that come.

www.rspb.org.uk/advice/gardening/reptiles_amphibians/hibernacula.asp

Our Air



Our Water



Our Land



Our World



LEVEL

2

3

ACTIVITY
B.09

Build a pond to create a new habitat for insects, amphibians, plants and others. Make sure you plant only native species. **PONDS CAN BE BREEDING GROUNDS FOR MOSQUITOES OR OTHER DISEASE-CARRYING INSECTS. IF THIS IS A PROBLEM IN YOUR AREA, BE SURE TO STOCK THE POND WITH FISH SPECIES THAT EAT INSECT LARVAE.**

GROUP ACTIVITY

LEVEL

2

3

ACTIVITY
B.10

Some species are important for cleaning water and making it available to other species living in the ecosystem. These filtering species can remove bacteria, viruses, heavy metals, toxins and/or debris. Compare the methods used by different species, such as oysters, mosses and trees, to filter water. Make your own water filter using natural or recycled materials. For ideas on making water filters visit www.ewb.ca/en/whatwedo/canada/projects/hso/teachers/w4w/workshop.html or library.thinkquest.org/04apr/00222/filter.htm

LEVEL

2

3

ACTIVITY
B.11

Meet with a local government or local conservation agency responsible for a stream or river. Invite them to make signs that will encourage people to protect these areas. Volunteer to paint and to help put up those signs.






Yae Sung Park, aged 15, Republic of Korea




Aulia Syaffitri, aged 15, Indonesia






Think downstream

- LEVEL    Make a rain barrel out of clean recycled material. List all the possible uses for the collected water. Use the water for some of the examples on your list.




ACTIVITY B.12

- LEVEL    Pollution can hurt biodiversity. Do an experiment to find out how an oil spill can damage a bird's feathers. Take two feathers. Use a cotton ball to rub one feather with a few drops of cooking, bike or lubricating oil. Pour some water onto each of the feathers. What happens? How do you think an oil spill would affect birds? Share your answers with your group.




ACTIVITY B.13

- LEVEL    The sea and sea life appear in many folk tales, novels, poetry, songs and works of art. Find some examples. Which aspects are real and which ones are make believe? Where do you think the make believe aspects come from? Create your own artistic work of the sea or sea life.

ACTIVITY B.14



- LEVEL    The biodiversity in oceans provide humans with various nutritious foods, including plant-based foods. Make a poster or drawing of all the different uses that humans use marine biodiversity.

ACTIVITY B.15



- LEVEL    Marine ecosystems can help protect coastal regions from damage from storms. What would happen to these regions if the marine ecosystems that protect them are destroyed? Create a poster, comic, play or other suitable medium to teach people about the value of these marine ecosystems.

ACTIVITY B.16





LEVEL   Learn how bacteria in sea water and marine mammals help to breakdown and remove waste and pollution. Share your findings with your group.

ACTIVITY B.17


LEVEL   Did you know that, in the case of fresh wild-caught fish, it is better to buy certain species in certain months? This ensures the fish aren't caught during their spawning season. Prepare a calendar showing when it's okay to eat different fish species. For each month, draw images of that fish species that can be eaten without harming wild populations. Hang the calendar at your school or community centre.

ACTIVITY B.18

LEVEL   Visit a grocery store and inspect the fish counter and canned fish aisle. Record the brands and fish species that carry a logo indicating they are harvested or farmed sustainably (such as the Marine Stewardship Council logo). Make a poster encouraging people to buy these brands and species. Ask the store manager if you can hang the poster in the store.



ACTIVITY B.19

LEVEL  Investigate grey water recycling. Invite a representative from your local government water department to talk with your group. What is grey water recycling? When and where is it appropriate? What regulations does your area have for grey water recycling? Design the ideal grey water recycling system for your home or school. Present your findings to your friends, class or group.

ACTIVITY B.20



Robin Boar-Low, aged 16, Italy

All species need water

LEVEL 1 2 ▲

ACTIVITY B.21

Visit a wetland near your home. Observe different species of birds that catch their food in the water. How do they hunt – by wading, by diving from the air, by dappling? What are the shape and size of their beaks? What are the shape and size of their legs? Which traits are best suited for different ways of hunting? Draw three birds and point out how their beaks and legs are suited to their way of catching food.

LEVEL 1 2 ▲

ACTIVITY B.22

Learn about unusual modifications that plants and animals have evolved to adapt to environments where water is difficult to find. Find five examples for plants, and five examples for animals. Present these examples to your group.



Seung Min Ryu, aged 9, Republic of Korea



Sahda Samiya, aged 10, Indonesia



LEVEL 1 2 3

ACTIVITY
B.23

Do an experiment to test the effects of acid rain on plants. Grow three plants in three separate pots under identical conditions except for the watering. Water the first plant with 100 percent water. Water the second plant with a mixture of 90 percent water and 10 percent lemon juice or vinegar. Water the third plant with a mixture of 50 percent water and 50 percent lemon juice or vinegar. What happens? How do you think acid rain affects plants and trees? Share your finding with your group.

LEVEL 1 2 3

ACTIVITY
B.24




Organize a masquerade party. Have everyone come wearing a mask of an animal that lives in the sea. Ask each person to learn three facts about their chosen species. Play water-themed games. Older participants can design and lead these games.

GROUP ACTIVITY

Atalanta Shi, aged 14, Canada









LEVEL    Go out in a boat. Observe all the plants (seaweed) and animals (birds, fish, shellfish, etc.) you see, hear and smell. Create a short report summarising your findings.

ACTIVITY B.25




PRACTICE SAFE BOATING. TAKE WATER SAFETY PRECAUTIONS AND MAKE SURE THERE'S QUALIFIED SUPERVISION.

LEVEL    Go rock pooling in tidal pools. Build an underwater viewer to get a fish's eye (or crab or sea cucumber or ...) view. Draw the beach and where you find the different species. Which species are closest to and furthest from the shore? What special features do the species have that allow them to live in intertidal zones? Share your findings with your group. www.rspb.org.uk/Images/rock_pooling_tcm9-193626.pdf

ACTIVITY B.26




LEVEL    Make yourself a hide (a camouflaged shelter where you can observe animals without disturbing them) next to a lake, pond or stream. The hide will keep you hidden from wildlife. Spend a day in your hide recording the insects, mammals, birds, reptiles and amphibians that come to the water.

ACTIVITY B.27

LEVEL    Visit a water body at least once a season over the course of a year. Photograph or draw a picture of the plant and animal life present in each season. Record the temperature and describe the weather conditions. How do the seasonal conditions affect plant and animal life over the year?

ACTIVITY B.28

GROUP ACTIVITY

LEVEL    Do any other activity approved by your teacher or leader.

Our Land

section C

DO THE FIRST ACTIVITY AND ONE OTHER ACTIVITY OF YOUR CHOICE. AFTER COMPLETING OUR **LAND** ACTIVITIES YOU WILL BE ABLE TO:

- >> **KNOW** and appreciate the land-based species and ecosystems in your area
- >> **DESCRIBE** some of the uses of biodiversity



Martyna Gauronskiytė, aged 12, Lithuania

LEVEL 1 2 3

ACTIVITY C.01

Interview a grandparent or elderly friend (or even an adult pretending they were born many years ago) about the foods they grew and ate as a child. How were these foods prepared? Why were these foods grown and not others? Are the foods different from the ones that you grow, cook and eat today? Why or why not? If possible, try preparing some 'old-fashioned' food. Share your findings with your friends, group or to Bioersity International's 'Oral History Project'. Visit the website:

diversityforlife.org/about-the-campaign/activities/oralhistory

GROUP ACTIVITY

Our Air



Our Water



Our Land



Our World



Biodiversity on the menu

LEVEL **1 2** ▲
ACTIVITY C.02
 What do you need for a healthy diet? Find out how biodiversity contributes to good nutrition by imagining what would happen if there was only one type of fruit, one type of vegetable and one type of meat available. Share your findings with your teacher, leader or group.

LEVEL **1 2** ▲
ACTIVITY C.03
 Invent a game about seeds and biodiversity. For example, you could invent a matching game where players have to match actual rice, corn, wheat or other seeds with clues or drawings of the plant. Play the game with your friends.

LEVEL **1 2** ▲
ACTIVITY C.04
 Ask an indigenous person (sometimes called First Nations, Aboriginal or Native person in different parts of the world), your parents, grandparents or elderly friends to teach you how to recognize wild edible herbs and plants. Make a collage showing the herbs and plants and their uses. **DON'T PICK AND EAT ANY PLANTS BECAUSE SOME POISONOUS PLANTS LOOK VERY SIMILAR TO NON-POISONOUS ONES.**

LEVEL **1 2** ▲
ACTIVITY C.05
 Visit a market or grocery store. Look for examples of species diversity and genetic diversity, two levels of biodiversity. (The third level is ecosystem diversity.) Count the number of vegetable species (such as carrots, cucumbers, lettuce). Find a species that has several varieties, for example potatoes. This is an example of genetic diversity within a species. How many varieties of potatoes are there? How are they similar? How are they different? What other foods have multiple varieties? Why is it important to have genetic diversity in crop plants? Share your finding with your class or group.

LEVEL 1 2 3

ACTIVITY
C.06

Record what you eat for five days. How many different things did you eat? Which animals and plants did your food come from? At the end of the week, help prepare a meal that uses lots of biodiversity. Share it with your family and friends. During the meal, talk about the biodiversity in each dish.

LEVEL 2 3

ACTIVITY
C.07

Predator-prey dynamics are important to healthy ecosystem functioning. Play the survival game with your group. What happens when one species goes extinct? What role does disease play? What effects do humans have? How would climate change affect the survival of the animals? The rules of the survival game are at dragon.sleepdeprived.ca/games/wide_games/wide_games_15.htm and www.snowleopard.org/catfactsclassroom/classroom/resources.

Knoxton Constant, aged 14, Antigua and Barbuda



Our Air

Our Water

Our Land

Our World

LEVEL

2 3

ACTIVITY
C.08

Pick a food item that is eaten in several countries around the world such as bananas, beans, tomatoes or maize/corn. Where did the food originate? Are there different varieties in different countries? How is the food cooked in different countries? Try three recipes from three different countries. Share your culinary creations with your family and friends. How do you think biological diversity relates to cultural diversity? Discuss your answers during the meal.

Ryanna Tee, aged 15, Philippines



LEVEL

2 3

ACTIVITY
C.09

In a grocery store, find five foods that are genetically modified. Is it easy or difficult to find them? How are they different from their relatives that are not genetically modified? How are they the same? Find three arguments for and three arguments against genetic modification of foods.

Gardening for goods

LEVEL

1 2

ACTIVITY
C.10

Inspect a handful of soil and describe the biodiversity. Look at a sample under a magnifying glass or a microscope. Draw the creatures you see.

LEVEL

1 2

ACTIVITY
C.11

How long do things take to decompose? Fill a box with soil. Bury ten samples (e.g. newspaper, apple core, tinfoil, glass bottle, leaf, plastic bag, candy wrapper and animal fur) and mark the location of each. Add some water so the soil is slightly damp. Once a week, dig up each sample and check how decomposed it is. Record your observations

for six to eight weeks. Based on the results of your experiment, how long do you think it will take for your garbage to decompose? If you live in a cold climate, try this experiment in a warm season.

LEVEL

1 2 3

ACTIVITY C.12

Grow a vegetable, herb, fruit, nut or spice garden. Nurture your green thumb in a container garden, a community garden, a rooftop garden or a backyard garden. Keep track of how much water and sunlight different plants need to grow best. What kinds of animals visit the garden? Why do you think animals come to the garden? Which animals help the plants by pollinating flowers or spreading seeds? Discuss your observations with your group. For information on setting up and running a group garden, see www.fao.org/docrep/009/a0218e/a0218e00.HTM.

GROUP ACTIVITY

Our Air

Our Water



Our Land



Our World



LEVEL

1 2 3

ACTIVITY C.13

Before the invention of artificial chemical dyes, clothes and other fabrics were coloured with natural dyes from roots, nuts, berries, flowers and other things found in nature. Make your own natural dyes from natural materials found in your neighbourhood, grocery store or market. Dye a t-shirt, bandana or other material.

BE VERY CAREFUL AND AVOID USING ANY POISONOUS PLANTS.

www.pioneerthinking.com/naturaldyes.html

LEVEL

1 2 3

ACTIVITY C.14

Learn about composting. What is it? What creatures are the workers in a compost? What can you put in a composter? What can't you put in a composter? What are the benefits of composting? Try composting - in a vermicomposter, backyard compost heap or compost box.

LEVEL 1 2 3

ACTIVITY
C.15

Find out what kind of soil plants prefer with a soil core experiment. Dig a hole 50cm deep. Fill one pot with topsoil collected in the top 2cm. Fill a second pot with subsoil collected 15cm from the surface. Fill a third pot with subsoil collected 50cm from the surface. Grow a plant in each of the pots. Chart each plant's growth for 6 to 8 weeks. Why do you think there are differences? Why is the erosion of topsoil a concern for farmers? Share your findings with your teacher, leader or group.

LEVEL 1 2 3

ACTIVITY
C.16

Visit three farms in your area that use different growing techniques and/or grow or raise different agricultural products. For example, you could visit a dairy farm, an organic market garden, a vineyard or a conventional cereal farm. Ask the farmers what sort of challenges they are facing and how biodiversity helps them face those challenges.

LEVEL 1 2 3

ACTIVITY
C.17

For thousands of years, biodiversity has provided humans with natural medicines and remedies. Find out which plants in your community have medicinal purposes. **DO NOT PICK THE PLANTS THEY COULD BE POISONOUS AS IT COULD BE A DIFFERENT SPECIES OR THE WRONG PART OF THE PLANT.**

LEVEL 1 2 3

ACTIVITY
C.18

Identify five rare varieties of crops or plants that grow in your community. What are their special characteristics? Where are these rare varieties grown? How are they similar to and different from their common variety relative? Find out what you can do to help conserve these rare varieties, then try it! If possible, do this activity as part of a farm visit.

LEVEL   **ACTIVITY**
C.19

Look at the labels on your clothing. Make a list of all the different materials found in your clothing. Sort them into two categories - natural and synthetic. What are the characteristics of natural fibres and synthetic fibres? Where are natural fibres grown? Which lasts longer - natural or synthetic clothing? Why would clothing manufacturers blend different types of fibres? Write a short report or tell your teacher or leader about your findings.

Protect habitats

LEVEL   **ACTIVITY**
C.20

Insects are everywhere. Studying them is a fun way to learn about nature and how different parts of biodiversity are linked to each other. Find a colony of ants and observe it regularly during two seasons. Find out what ants carry to their colony. Follow their path and measure it. What happens to ants and their home before or after a rainfall? Do all ants do the same work?

LEVEL   **ACTIVITY**
C.21

Reducing, reusing and recycling is good for biodiversity. One tonne of recycled paper saves 17 trees. More recycling means more habitat is saved for other plants and animals. Recycle paper by making your own. Use the paper to make a craft. Or, write a letter to someone special and send it to them. Don't forget to write that the paper is homemade! For ideas, see www.pioneerthinking.com/makingpaper.html or www.wipapercouncil.org/makepaper.htm



LEVEL 1 2 3

ACTIVITY
C.22

Walk through a field with tall grasses wearing trousers that collect a lot of seeds. At the end of your walk, change into a new pair of trousers and inspect the seeds that have collected on your trousers. How big are the seeds? Are some seeds found only at certain heights? How do you think these seeds would be dispersed in nature? You can also try this activity wearing different kinds of fur to mimic the different mammals that would walk through the field collecting and dispersing seeds. Are certain furs better for holding seeds than others? Share your findings with your group.

IF YOU WALK THROUGH A FARMER'S FIELD, DON'T FORGET TO ASK PERMISSION FIRST!

LEVEL 1 2 3

ACTIVITY
C.23

Create a biodiversity-friendly yard that offers lots of homes for species. Use recycled goods or material that might otherwise end up in the trash. Bee houses can be made from bundled bamboos straws, toad homes can be made from an old half-buried teapot. Use your imagination! Watch the wildlife that takes up residence in your yard.

LEVEL 1 2 3

ACTIVITY
C.24

Go for a walk in a forest. Record what you see, hear, smell and feel. **DON'T TASTE ANYTHING - IT COULD BE POISONOUS.** Observe from different vantage points. For example, look down, look under a fallen log, close your eyes and listen, make a bark rubbing, feel the texture of the soil, etc.

Yuyan Ho, aged 17, Hong Kong



Hiu Wing Chan, aged 17, Hong Kong



LEVEL 1 2 3

ACTIVITY C.25

Go for a walk in a natural area such as a forest or park. Look for animal signs such as browsed leaves or bark, animal tracks, holes in trees or in the ground, nests, fur, feathers and scat. Investigate the traces that animals leave behind (hair from their bristle, feathers, excrements, imprints). If possible, invite a biologist to come along. Make a drawing of three things you discovered, and present them to your group.

LEVEL 1 2 3

ACTIVITY C.26

Climb a mountain. Note the plant and animal life along your hike. What sort of changes do you observe at different elevations? How does the temperature, humidity and wind change? Are the same species found at both the top and bottom of the mountain? Why or why not? Discuss your discoveries with your group.

GROUP ACTIVITY

Our Air



Our Water



Our Land



Our World





Doris Lee, aged 14, Canada



Harsh Hero, aged 15, India

LEVEL 1 2 3

ACTIVITY C.27

Research rare tree species native to your area. Why are they rare? What animal species use these tree species for food and shelter? Choose one of these tree species and plant it in an appropriate location.

LEVEL 1 2 3



ACTIVITY C.28

Collect seeds and small plants (including the roots) from a ditch or alongside a road. Plant them in an open or closed terrarium, creating a miniature ecosystem. Care for them as they grow. If you dispose of them, be sure to put them back where you found them so you are not introducing alien species. www.stormthecastle.com/terrarium/terrariums-for-kids.htm



LEVEL 1 2 3

ACTIVITY C.29


Adopt and clean a natural area. Take an inventory of the plants and animals that live in that area. Describe their location in relation to each other. How do they depend on each other? Explain your findings to your group in words or in pictures.

LEVEL   What is a seed bank? Find out where seed banks are located in your area and country. Visit one, if possible. Find out how you can get involved in a seed bank.

ACTIVITY
C.30

LEVEL   Find a tree in a forest or natural area and plot a one metre radius around its base. On a piece of paper, draw all of the life forms you find within that area (e.g. grasses, mosses, lichens, insects, fungi, frogs, etc.). Try to identify the species names. If possible, invite a biologist or naturalist to help you with the activity.

ACTIVITY
C.31

LEVEL    Do any other activity approved by your teacher or leader.

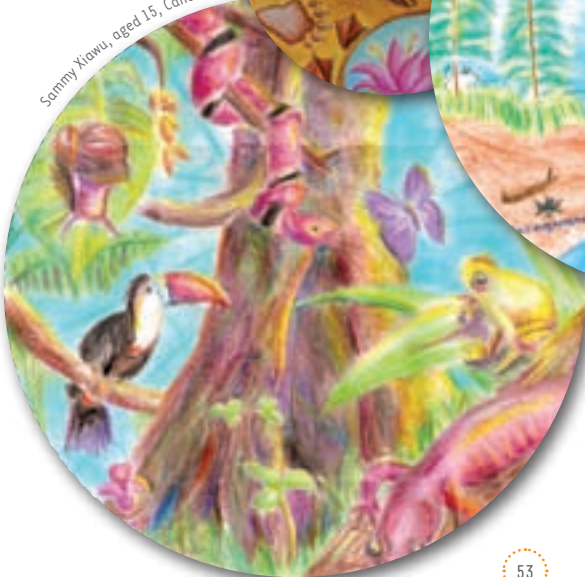
Daniela Karatranova, aged 16, Bulgaria



Mohamed Lissan Khaleel, aged 6, Maldives



Sammy Xrawu, aged 15, Canada



section D Our World

DO THE FIRST ACTIVITY IN THIS SECTION AND ONE OTHER ACTIVITY OF YOUR CHOICE. AFTER COMPLETING OUR **WORLD** ACTIVITIES YOU WILL BE ABLE TO:

- >> **DESCRIBE** the three components of biodiversity - genes, species and ecosystems
- >> **LIST** some threats to biodiversity
- >> **TAKE** action to protect biodiversity and share your efforts with other people

LEVEL 1 2 3

**ACTIVITY
D.01**

Make a collage, poster or video clip showing examples of all three components of biodiversity - genes, species and ecosystems. Present your collage to your class or group and answer the following questions. How do the different parts interact with each other? Why is each component important? What are some of the threats to biodiversity around the world?

GROUP ACTIVITY

Our Air

Our Water

Our Land

Our World



Justino Hernandez Gonzalez, aged 20, Mexico



Discover!

LEVEL 1

ACTIVITY D.02

Choose a threatened species in your area. Where does it live? What does it eat? What animals eat it? What are its habits? Why is it threatened with extinction? Who is responsible for that? Write a story or present a skit about what the environment would be like if that species goes extinct.



LEVEL 1

ACTIVITY D.03

Listen to podcasts about interesting species with your group. Submit answers to the challenges including recording what you think a sea cucumber sounds like when it squirts!

www.education.eol.org/podcast

LEVEL 1




ACTIVITY D.04

Explore a biodiversity website such as www.biodiversity911.org or www.eol.org. Play two online games. For example, learn how species are named by playing a species matching game at www.eol.org/games/identify_the_image. Visit one interactive map. Take one online quiz.




LEVEL 1

ACTIVITY D.05




Pick three countries that you would like to visit some day. What types of ecosystems are found in each of these countries? What is the national tree, flower, bird and animal of each country? What are the major threats to biodiversity in each country? Try to find some pictures showing nature in these countries.

LEVEL    Learn about endangered species and how consumer choices affect them directly and indirectly. For example, eating shark fin soup directly affects sharks because they are hunted for their fins. Eating lots of meat can indirectly affect endangered species living in rainforests because their habitats are destroyed to create pastures for grazing cattle. Prepare a poster portraying the most endangered species in your country, region or continent and the challenges they face.




ACTIVITY
D.06

LEVEL    Learn how indigenous people use biodiversity for their survival and in their cultures. (Indigenous people are also called First Nations, Aboriginal and Native people in different parts of the world.) If possible, invite an indigenous person to talk about biodiversity with your group. Identify one example per continent of how these communities use biodiversity. Share your findings with your group.




ACTIVITY
D.07

LEVEL    Different groups of people use and conserve biodiversity in different ways. Find three examples of how biodiversity is used differently by men and women, or by people living in the cities and people living in the countryside.

ACTIVITY
D.08

LEVEL    Pick a room. Identify the objects in it that originate from biodiversity, for example a wooden table was once an oak tree. Make a collage showing the links between the objects in the room and their biodiversity origins.

ACTIVITY
D.09

LEVEL    Interview a scientist about a biodiversity issue. Record it, then share it with your group.

ACTIVITY
D.10



LEVEL


ACTIVITY
D.11

What is a biodiversity hotspot? Why do you think they exist? Where are biodiversity hotspots found around the world? Take the Biodiversity Hotspots Quiz on planetgreen.discovery.com/games-quizzes/biodiversity-hotspots-quiz.

LEVEL


ACTIVITY
D.12

Invent a way of explaining biodiversity and its three components using at least two senses. For example, make a video with pictures and sound, or create a game where players learn about biodiversity through taste and touch. Explain biodiversity to your teacher, leader or group and answer the following questions. How do the different parts interact with each other? Why is each component important? What are some of the threats to biodiversity around the world?

LEVEL


ACTIVITY
D.13

Learn about *in-situ* and *ex-situ* conservation. What are the goals and challenges of each type? When would you use each type of conservation? Find some examples of each type in your area and/or country. Present your findings to your group.

LEVEL


ACTIVITY
D.14

Research how habitat fragmentation can affect genetic diversity within a species. Have a group debate on a relevant case study in your area. Assign roles to each person (such as town mayor, biologist, indigenous person, animal affected by habitat fragmentation, developer, etc.).

GROUP ACTIVITY

LEVEL


ACTIVITY
D.15

Research international treaties that aim to protect biodiversity, either in its entirety or a specific part of biodiversity. Share your findings with your group in the form of a play or poster.

GROUP ACTIVITY

Be creative!

LEVEL 1 2 3

ACTIVITY D.16

Invent a game that helps people learn about the importance of biodiversity. Play it with your group. Older participants can design and lead a game for younger children. An example of a biodiversity card game can be seen at:

www.bgci.org/education/article/443

GROUP ACTIVITY

LEVEL 1 2 3

ACTIVITY D.17

Make an art object out of natural materials. Encourage other members of your group to also make objects. Host and display your creations in a natural art exhibition with stories about the materials and the message your art is sending.

LEVEL 1 2 3

ACTIVITY D.18

Biodiversity inspires fashion: designers create fabrics that looks like animal skins, jewellers make pieces using shells, bark and other natural material, and clothing companies use natural fibres such as cotton, hemp, wool and silk. Create an article of clothing or a piece of jewellery that uses or is inspired by biodiversity. Host a biodiversity fashion show with your group.

Danta Gabriela Bejrnari, aged 12, Romania



Rainbow Tse Lok Ya Tse, aged 13, Hong Kong



LEVEL **1** **2** **3** Animals move in all sorts of different ways.

ACTIVITY
D.19

Participate in an animal yoga class where all of the exercises mimic the movements of different animals found around the world. Take turns leading the movements. Older participants can design and lead a class for younger children.

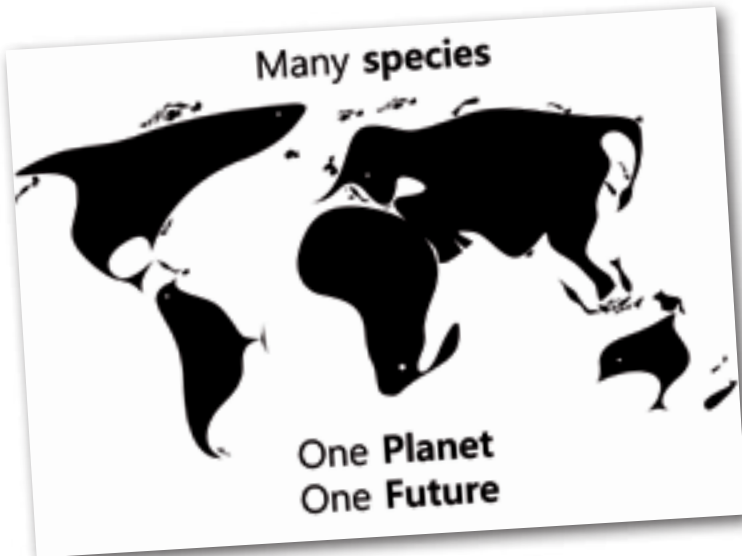
GROUP ACTIVITY

LEVEL **2** **3** Write a radio script about a biodiversity issue that is important in your community. Encourage your local radio station to record and broadcast it. You could offer yourself and your friends to be the voice actors!

ACTIVITY
D.20

LEVEL **2** **3** To make life easier and more enjoyable, people invented tools, appliances and new materials. Many of these things remind us of nature. What is nature's equivalent of: an excavator, parachute, flipper, sonar and paper? What are four other examples of human inventions that were inspired by nature?

ACTIVITY
D.21



Gwanghui Joe, aged 17, Republic of Korea

Reach out!

- LEVEL **1** **2** **3** **ACTIVITY D.22** Make a commercial about biodiversity. Record it and post it on YouTube. Monitor the number of hits (the number of people who watch your commercial) and the comments on the website for one month. Report back to your group. Make sure you have the permission of everyone in the video, and their parents, before you post it.

- LEVEL **1** **2** **3** **ACTIVITY D.23** On the International Day for Biological Diversity (22 May) organize activities and celebrations to raise people's awareness on the importance of biodiversity. Use posters, songs, poetry, artwork, concerts, drama, sports, contests, photos, slogans, workshops, newsletters, e-cards, taste-testing, videos, etc. You can also join events held by other people in your country. Visit cbd.int/idb for ideas.

GROUP ACTIVITY

- LEVEL **1** **2** **3** **ACTIVITY D.24** Hold your own backyard species inventory called a BioBlitz using the activities found at www.education.eol.org/bioblitz/activities. Share photographs or drawings online at www.education.eol.org/bioblitz/gallery.

- LEVEL **2** **3** **ACTIVITY D.25** Organize and host an environment-themed workshop. Invite your family and friends to participate.



GROUP ACTIVITY

Our Air



Our Water

Our Land



Our World

- LEVEL   Visit three online platforms where young people share information and support each other's actions on biodiversity and environmental issues. Join and contribute to one of them. Some examples are:
www.tigweb.org, greenwave.cbd.int and uniteforclimate.org

ACTIVITY
D.26




- LEVEL   Start a biodiversity blog (an online journal where readers can comment on the journal entries) or diary. Record tips on what young people can do for biodiversity. If you prefer working offline, share your blog or diary in your school newspaper or on your school radio station.

ACTIVITY
D.27

- LEVEL   Get a newspaper and read all articles about biodiversity. Use one of the articles as a starting point for a letter to the editor. Submit your letter to the newspaper. If you don't have access to newspapers, you can modify this activity to respond to radio or other media stories.

ACTIVITY
D.28

Take action!




- LEVEL    Conduct a waste audit in your house, school or other location. Create an action plan to reduce the amount of waste you produce and to divert waste away from landfill. Carry out your plan. For ideas, visit

ACTIVITY
D.29




www.globalfootprints.org/pdf/waste_num34.pdf






Dario Fernández, aged 17, Spain

LEVEL    Write to your government representative about a biodiversity issue that concerns you. Don't forget to offer some solutions.

ACTIVITY
D.30

LEVEL    Get involved with biodiversity conservation. Join a conservation organization. Visit a wild animal rescue centre and offer to help in the centre for a period of time. Report to your group on your activities, what interests you and how your efforts are helping biodiversity.

ACTIVITY
D.31

LEVEL    Encourage your friends and group to participate in *The Green Wave*. Find out more at greenwave.cbd.int.




ACTIVITY
D.32

GROUP ACTIVITY

LEVEL    Organize and host a fundraiser for a biodiversity cause.




ACTIVITY
D.33

GROUP ACTIVITY

LEVEL    Become a community organizer. Organize an event to raise public awareness about a specific local biodiversity issue. Have a specific goal. Make a banner and posters to publicise the event. Contact your local media (TV, radio and newspapers) and ask them to cover the story. Try and get as many people as possible to come out to your event.

ACTIVITY
D.34

GROUP ACTIVITY

LEVEL    Do any other activity approved by your teacher or leader.

Our Air



Our Water



Our Land



Our World



Resources and additional information

TO HELP YOU AND YOUR GROUP undertake this challenge badge a number of resources are being put together and can be found on the FAO Children and Youth Climate Change Web site: www.fao.org/climatechange/youth/60638/en

SPECIFIC RESOURCE MATERIALS will also be developed for the activities listed in this booklet and will be placed at the web link above. If you would like to be automatically informed of new resources, please write to us and register for the free YUNGA newsletter: children-youth@fao.org





Aby Adrahim, aged 12, Qatar

Useful websites and books

BIOVERSITY INTERNATIONAL has many resources on agricultural biodiversity:
www.biodiversityinternational.org

ON THE BIRDLIFE WEBSITE, learn about birds, their habitats, global biodiversity and examples of conservation projects:
www.birdlife.org

THE CONVENTION ON BIOLOGICAL DIVERSITY youth pages have information about the CBD and biodiversity and lots of activities and resources for young people:
www.cbd.int/youth

THE ENCYCLOPEDIA OF LIFE is an online reference and database of all species known to science:
www.eol.org

THE FAO CHILDREN AND YOUTH CLIMATE CHANGE portal contains activities, resources, events, competitions and projects related to biodiversity, climate change and other issues that concern youth:
www.fao.org/climatechange/youth/en

THE GREEN WAVE website is your gateway to an exciting biodiversity project for young people. It has lots of resources and stories about how youth around the world are celebrating biodiversity:
www.greenwave.cbd.int

THE ROYAL SOCIETY FOR THE PROTECTION OF BIRDS in the U.K. has an excellent programme for children. Visit the Wildlife Explorers website for great resources and activities. Several activities in the Wildlife Action Awards inspired activities for this badge:
www.rspb.org.uk/youth

David Suzuki and Kathy Vanderlinden. (2001). *Eco-fun: great projects, experiments and games for a greener Earth*. Vancouver (B.C.): Greystone Books.

TUNZA is the children and youth programme of the United Nations Environment Programme. The website has information about youth activities and campaigns, as well as publications and multimedia resources:

www.unep.org/tunza

THE UNITED NATIONS CYBERSCHOOLBUS is a global teaching and learning project that covers topics such as peace, human rights, environment, health and oceans:

www.cyberschoolbus.un.org

THE WORLDBIRDS WEBSITE is your entry point to an incredible global citizen science project on birds:

www.worldbirds.org

THE WAGGGS WEBSITE contains many resources and news on environmental issues such as the *Together we can change our world* badge about the Millennium Development Goals:

www.wagggsworld.org

WWF takes you from the basics of biodiversity through to the intricacies of soil, climate change and fisheries:

www.biodiversity911.org/default.html

See what other challenge badges and activities are available on the YUNGA Web site www.yunga.org

Glossary

- >> **Adaptation:** special characteristic that helps an organism to survive and/or to reproduce.
- >> **Amphibians:** a large group of animals that usually have moist skins and most live in or in association with freshwater – including frogs, toads, newts and salamanders. Most have eggs without shells, laid or developing in water or moist environments.
- >> **Biodiversity:** the variety of life on Earth, at each of the genetic, species and ecosystem levels, and the relationships between them.
- >> **Biodiversity hotspot:** an area especially rich in plant and animal life, but in grave threat of being destroyed. To be recognized as a biodiversity hotspot, the area must: have at least 1 500 endemic species of vascular plants, and have lost at least 70 percent of its original habitat.
- >> **Climate change:** a change in the overall state of the Earth’s climate caused by natural and human causes such as the build-up of greenhouse gases, such as carbon dioxide, in the Earth’s atmosphere.
- >> **Conservation:** changing needs or habits with the aim of maintaining the health of the natural world, including land, water, biodiversity, and energy.
- >> **Ecosystem:** the physical and biological components of an environment, and their interactions. An ecosystem is relatively self-contained and is defined by the types of organisms found there and their interactions, (e.g. forest, grassland, lake).
- >> **Ecosystem goods and services:** the benefits that the environment, including humans, obtains from ecosystems. The four types of ecosystem services are: provisioning, regulating, cultural and supporting.
- >> **Ex-situ conservation:** off-site conservation in which plants or animals are removed from their natural habitat and placed in a new location such as a zoo or seed bank.
- >> **Fragmentation:** process whereby parts of a habitat become separated from one another because of changes in a landscape. Fragmentation makes it difficult for species to move throughout a habitat, and poses a major challenge for species requiring large areas of land.
- >> **Gene:** a chemical structure inside a cell that determines certain characteristics of an organism, and which is passed down from parent to offspring.
- >> **Genetically modified:** see Living modified organism.

- >> **Genetic diversity:** the variety and richness of genes in a population or species.
- >> **Habitat:** the local environment in which an organism is usually found.
- >> **Indigenous Peoples:** are any ethnic group who inhabit a geographic region with which they have the earliest known historical connection.
- >> **In-situ conservation:** on-site conservation in which plants or animals are protected in their natural habitats, either by protecting or cleaning up the habitat, or by defending the species from disease, competitors and predators.
- >> **Living modified organism (LMO):** an organism produced by modern biotechnology in which scientists have taken a single gene from a plant or animal cell or from a bacterium, and then inserted it into another plant or animal cell. LMOs are commonly known as genetically modified organisms (GMOs).
- >> **Microorganism:** a creature too small to be seen by the human eye alone, but can be seen through a microscope. In ecosystems, they help in recycling nutrients.
- >> **Natural resource:** something from nature that can be used to make something else; farmers need natural resources, such as land, air, water and sunlight, to grow food.
- >> **Organism:** an individual living creature such as a spider, walnut tree or human.
- >> **Pollinator:** an animal that carries pollen from one seed plant to another, unwittingly aiding the plant to reproduce. Common pollinators include bees, butterflies, moths, birds and bats.
- >> **Reptiles:** snakes, lizards, crocodiles, turtles and tortoises etc. Some are terrestrial (land living), others live on both land and in water, some exclusively in water (e.g. freshwater turtles). Most have eggs with shells which are laid and develop out of water.
- >> **Species:** a group of similar organisms which are able to breed together and produce healthy, fertile offspring (offspring that are able to produce young).
- >> **Trait:** a characteristic or distinguishing feature that identifies an organism, like curly hair or tallness. In agriculture, important traits include those that affect a plant's yield or resistance to disease. Some traits are inheritable and others are not.
- >> **Watershed:** an area of land that catches rain and snow, and drains into a larger body of water such as a marsh, stream, river, lake, ocean or groundwater. A watershed (sometimes called a drainage basin) can be as small as a few hectares or as large as thousands of square kilometres.

Acknowledgements

Gratitude goes to Chris Gibb for coordinating the development of this booklet and to Margherita Ascione, Alessia Battistoni, Veronica Barria, Chiara Padellaro, Diana Remache Cerda, Alessandra Silvi, Giulia Tiddens and Maria Volodina for their efforts on the project and inputs and contributions to the text.

A big thank you goes out to everyone who made the biodiversity challenge badge a reality. Thank you to BirdLife International, the Encyclopedia of Life, the Royal Society for the Protection of Birds, and to all the enthusiastic Guides and Scouts in Australia, Canada, Ireland, Italy, Singapore, St Lucia, Trinidad and Tobago, Turkey, U.S.A. who thoughtfully reviewed and tested the initial drafts of the badge.





This badge has been developed with the kind financial support of the **Swedish International Development Agency (Sida)**.

www.sida.se

THIS BADGE WAS DEVELOPED BY:

Food and Agriculture Organization of the United Nations (FAO)



FAO leads international efforts to defeat hunger. Serving both developed and developing countries, FAO acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policy. FAO is also a source of knowledge and information, helping countries to modernize and improve agriculture, forestry and fisheries practices and ensure good nutrition for all. www.fao.org/climatechange/youth/en



Secretariat of the Convention on Biological Diversity (CBD)

The Convention on Biological Diversity came into force on 29 December 1993 with the objectives to conserve biodiversity, use it in a sustainable fashion and to share its benefits fairly and equitably. The CBD Secretariat manages biodiversity policy discussions, facilitates the participation of countries and groups in biodiversity processes and supports the implementation of the Convention. www.cbd.int/youth



World Association of Girl Guides and Girl Scouts (WAGGGS)

WAGGGS is a worldwide movement providing non-formal education where girls and young women develop leadership and life skills through self-development, challenge and adventure. Girl Guides and Girl Scouts learn by doing. The Association brings together Girl Guiding and Girl Scouting Associations from 145 countries reaching 10 million members around the globe. www.waggsworld.org



The Green Wave

The Green Wave is a global campaign to educate children and youth about biodiversity. The main activity centres around local tree-planting celebrations held each year at 10am local time on the International Day for Biological Diversity on 22 May. Collectively, all of these Green Wave celebrations create a 'green wave' that starts in the far east and travels west around the planet. www.greenwave.cbd.int



Youth and United Nations Global Alliance (YUNGA)

YUNGA was created to allow children and young people to be involved and make a difference. Numerous partners, including UN agencies and civil society organizations collaborate in developing initiatives, resources and opportunities for children and young people. YUNGA also acts as a gateway to allow children and youth to be involved in the UN related activities such as the Millennium Development Goals (MDGs), food security, climate change and biodiversity. www.yunga.org

your
no



PRINTED IN ITALY ON ECOLOGICAL PAPER - NOVEMBER 2010 - Design and layout: studio@bartoleschi.com



FOR FURTHER INFORMATION:



**YOUTH AND UNITED NATIONS GLOBAL ALLIANCE (YUNGA)
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO)**

VIALE DELLE TERME DI CARACALLA, 00153 ROME, ITALY
E-MAIL: CHILDREN-YOUTH@FAO.ORG
WEB SITE: WWW.FAO.ORG/CLIMATECHANGE/YOUTH

SECRETARIAT OF THE CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

WORLD TRADE CENTRE
413 ST. JACQUES STREET, SUITE 800
MONTREAL, QUEBEC, CANADA H2Y 1N9
E-MAIL: SECRETARIAT@CBD.INT
WEBSITE: WWW.CBD.INT

WORLD ASSOCIATION OF GIRL GUIDES AND GIRL SCOUTS (WAGGGS)

WORLD BUREAU, OLAVE CENTRE, 12C LYNDHURST ROAD
LONDON NW3 5PQ, ENGLAND
E-MAIL: WAGGGS@WAGGGSWORLD.ORG
WEB SITE: WWW.WAGGGSWORLD.ORG