

SUSTAINABLE
DEVELOPMENT
GOALS



Soil and Water

Sources of Life in an Enchanted Kingdom



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Embrapa

Brazilian Agricultural Research Corporation
Embrapa Soils
Ministry of Agriculture and Livestock

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Foreword

“Once upon a time ...”

This booklet contains a magical story about an enchanted kingdom and its sources of life: soil and water. The story is told by teacher Ana to her beloved students, under the leafy canopy of a beautiful tree in the school garden in celebration to World Soil Day, December 5th.

In its core, the booklet carries a message of hope by helping readers learn, in a playful way, information about the water cycle and how one of its phases – the rain – is related to erosion and soil degradation which can compromise the production of healthy foods, as well as water supply and availability and ultimately the quality of life.

In this booklet, one can also learn about the actions that farmers and city dwellers must take to ensure nutritious agricultural produces, while leading a happy life in sustainable cities.

With the story for children in this booklet, the authors wish to strengthen the importance of Soil Education as a fundamental tool to achieve, if not all, most of the goals for sustainable development.

This work is part of the scientific book contest for children whose theme is “Soil and water: a source of life”. It is an initiative of the Food and Agriculture Organization (FAO) of the United Nations its World Soil Alliance (GSP) and the International Union of Soil Science (IUSS) for the 2023 commemoration of World Soil Day on December 5th

This book contemplates many of the sustainable development goals (SDG) In particular, the goals 2.4, 4.7, 5.b, 12.8, 15.3 and 17.7 and it aims to contribute with sustainable production systems of food and to implement agricultural resilient practices, that help to increase the productivity and the production, that helps to maintain the ecosystem, that will enhance the capacity of adaption to the various changes in climate, the extreme meteorological conditions. Drought, floods and other disasters, and that progressively improve soil, water and agrobiodiversity quality, aiming the water, energy and food security.

Cheers to the World Soil Day, December 5th.

Maria de Lourdes Mendonça Santos Brefin
Head of Embrapa Soils

Preface

For me, it is a source of great honor and joy to receive the invitation to write the preface for such an important book for Soil Education, not only in Brazil, but in the world. While I was enchanted by this pleasant reading, I could imagine that children, young students and teachers will be able to learn in a playful, dynamic and creative way about the importance of the soil-water relationship on our planet. This book is captivating to read, having the power to awaken curiosity and to improve knowledge for people from anywhere, for any age group.

As a Basic Education Teacher in the context of Rural Education, I can affirm that actions like this, of extension and communication of knowledge built within teaching and research institutions, make me feel and observe more and more that a didactic language aimed at the younger public is the great action mechanism of the verb “to hope”, used by master Paulo Freire.

During reading, it is possible to identify the precious knowledge of master Ana Maria Primavesi in the speech of teacher Ana, who lovingly transmits her knowledge to her students. They, in turn, actively participate and demonstrate all the knowledge that they have on the topic.

Through its wonderful illustrations and rich content, “*Soil and Water: the sources of life of an enchanted kingdom*” takes the reader on an immersive journey, through which they are allowed to understand processes related to the water cycle, soil formation, color diversity and soil life.

Added to this, this book brings an important reflection regarding the care and management of soils so that degradation does not occur,

a factor that would result in the much-feared erosion. Erosion is portrayed in a song by Luiz Gonzaga, which says:

“(…) Erosion is like a snake / Cracking the earth, devouring the ground / And the wealth that belonged to us / It all goes away with erosion (...) / I learned the right way to protect the land and my farm / Oh, my people, what an abundance, so much wealth spreading across the ground / It’s cassava, girimum caboclo, sweet potatoes, watermelon and melon / String beans getting tangled up in everything / It’s nice to see my farm / There, in the reservoir, the water is so clean, it mirrors the green and creation.”

The book also highlights the important role of family farmers in agroecological-based conservation agriculture, giving a leading role to these important caretakers of the soil, water and forests, in the cultivation of healthy foods. Finally, it also reinforces the important roles that residents of urban centers play in the fight for the conservation of these valuable resources, symbolizing that we are all united in the same tangled web of threads.

I would like to thank the authors for their generosity, love and commitment to collectively building a type of Soil Education that allows us to expand horizons, especially that of children and young people who represent hope and the future of life in our home called Earth. And I invite everyone to enjoy reading, to have fun with the incredible activities that are suggested in the book, and transmit the knowledge acquired in a meaningful way, dispersing good seeds and contributing to balance and respect for nature, where the soil is the basis of all life.

Maria Clara Estoducto Pinto

Professor at the Belgium Nova Friburgo Institute /
Alternation Family Training Center of Nova Friburgo -
CEFFA Flores and Rei Alberto I.

Hello, my dear students. You remember that last year we celebrated World Soil Day, December 5th, with a special picnic about the origins of food, right?

Yes, teacher Ana.... And I brought a delicious carrot cake that my grandmother Nina had made with ingredients grown in the soil at Solo Vivo Farm.

That's right, Gabriel!

Today we are going to celebrate World Soil Day by reading a little story in this magical booklet. The story is about two sources of life in an enchanted kingdom and their importance for humans, animals, and plants.

Yay, that's cool teacher Ana... Let's travel through the enchanted kingdom!

WORLD SOIL DAY



Once upon a time, there was an enchanted and wonderful kingdom with rocky mountains, rolling hills, plains, and valleys with colorful soils.

In this kingdom, beautiful landscapes were covered with the graceful green of natural vegetation or the plantations that provide us with food...




Or even covered by white snow or by ice of icebergs and glaciers...

And by a gorgeous gold-sand desert and also by the natural arid regions of the hinterland...

Not to mention the blueish and greenish rivers, lakes, seas, and oceans, which shined brightly under the sun rays.

We are enchanted by such beauty, teacher Ana.



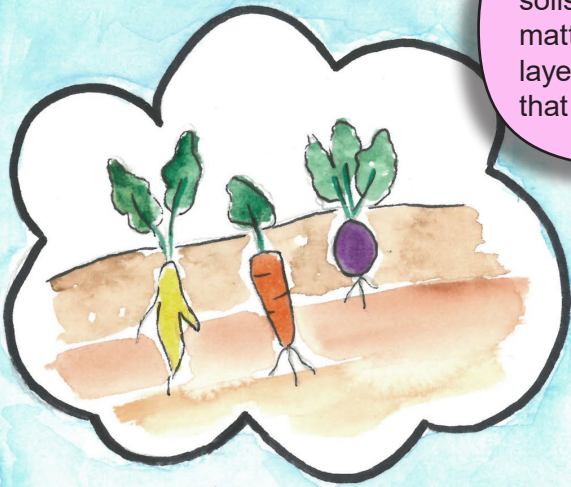
In the Enchanted Kingdom, water is one of the sources of life that animates life on the continents, islands and in aquatic environments and this precious water can be fresh, brackish (half sweet, half salty), or salty.

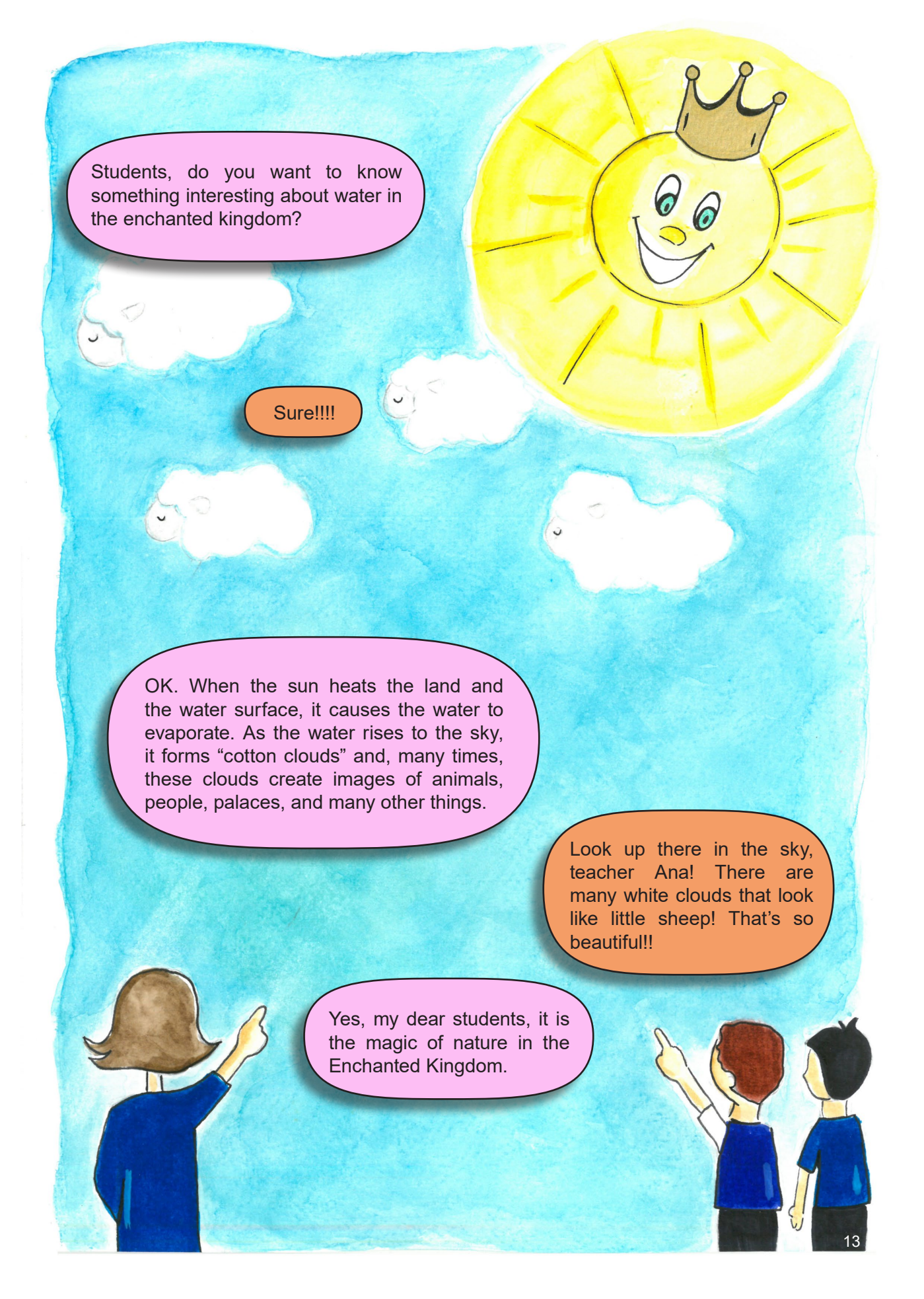
Water is everywhere in the kingdom, in the rivers, lakes, and oceans, in the clouds, in the air we breathe, in the ice and snow, and also in the soil.

Speaking of the soil, it is the other source of life, very important for all inhabitants of the kingdom, because the soil supplies nutrients and water for plants to grow strong and healthy, providing food in abundance in the Enchanted Kingdom.

Teacher Ana, I remember you taught us that soils come from rocks and organic matter and can have different colors: white, black, gray, brown, red, yellow, among others.

That's right, Gabriel. And the soils have minerals, organic matter, air, water, different layers, and a rich biodiversity that makes it a living soil.





Students, do you want to know something interesting about water in the enchanted kingdom?

Sure!!!!

OK. When the sun heats the land and the water surface, it causes the water to evaporate. As the water rises to the sky, it forms "cotton clouds" and, many times, these clouds create images of animals, people, palaces, and many other things.

Look up there in the sky, teacher Ana! There are many white clouds that look like little sheep! That's so beautiful!!

Yes, my dear students, it is the magic of nature in the Enchanted Kingdom.



OK, so, continuing our story, now, I will tell you about the rain that falls from the sky until it reaches the surface of a plantation that produces food in the Enchanted Kingdom.



Yay, rain shower!!!

When it rains on a field full of healthy plants of a careful farmer, rainwater calmly finds its way into the soil and is absorbed, filtered, and stored inside. The soil is a source of clean water for life inside the soil and above ground.



But, if rain falls on the farm of a careless farmer who leaves the soil without vegetation cover, degraded soils with sick and weak plants, the rain drops break the soil "clods" that are then dragged into the rivers, causing floods in the countryside and in cities.

Oh, My!!! How scary, teacher Ana.

It's the action of a villain called "erosion", which destroys the sources of life and scares the Enchanted Kingdom.



Erosion weakens the soil. It steals its nutrients and mistreats the animals responsible for keeping the soil alive, such as the earth cockroach, the pillbug, spiders, earthworms, ants, termites, fungi and bacteria, among others.

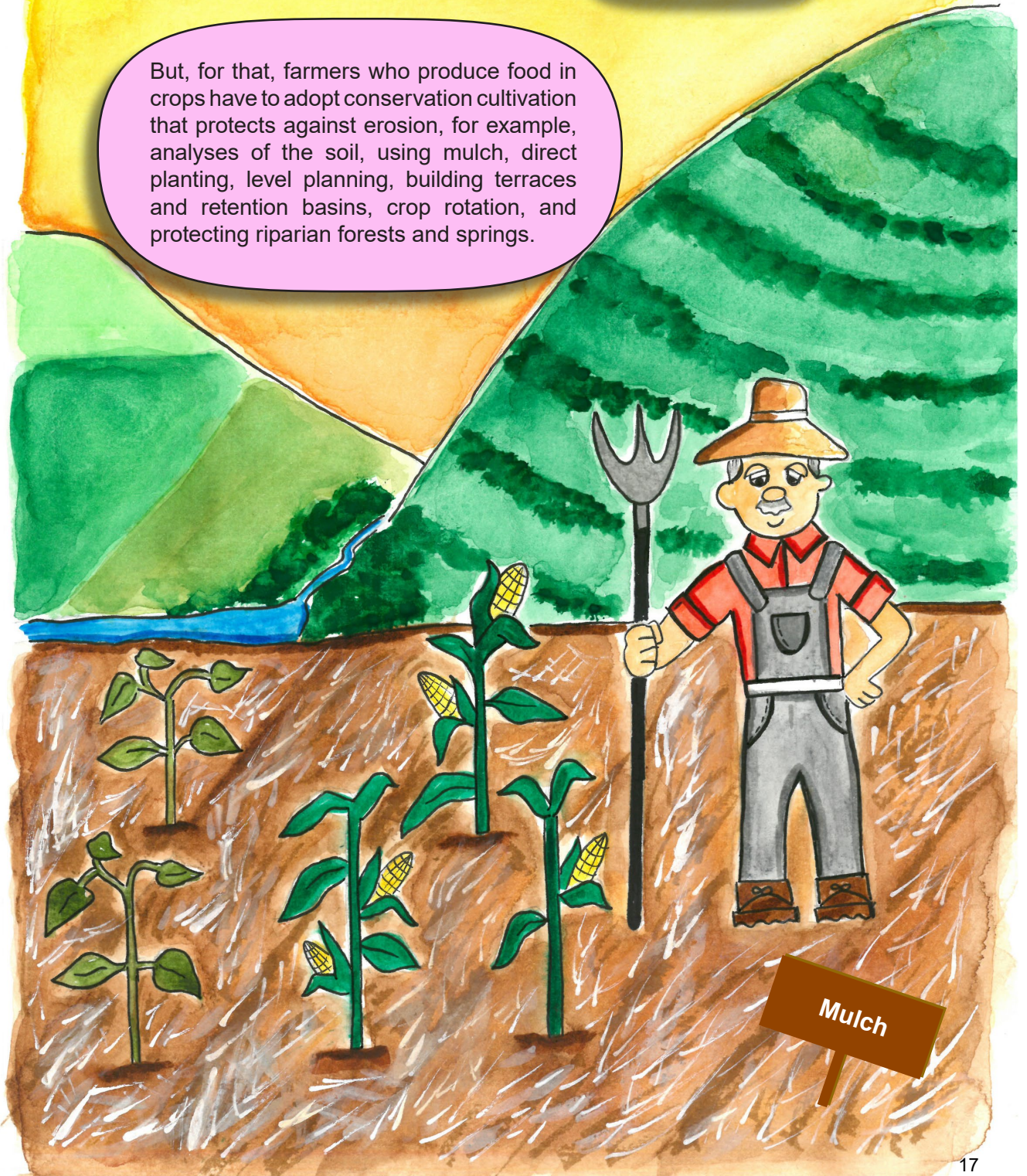
For this story to have a happy end with lots of joy and prosperity, the residents of the Enchanted Kingdom need to take care of the soil, water, and biodiversity...



You remember I always say that healthy soils produce nutritious and healthy food and ensure food to all of us, right?

Sure!!!

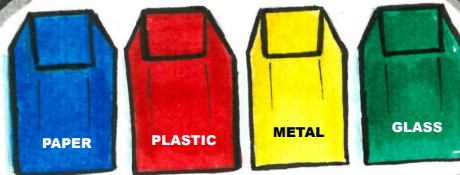
But, for that, farmers who produce food in crops have to adopt conservation cultivation that protects against erosion, for example, analyses of the soil, using mulch, direct planting, level planning, building terraces and retention basins, crop rotation, and protecting riparian forests and springs.



City residents also need to ensure sustainability of the Enchanted Kingdom and dispose waste for recycling, protecting life in the continents and oceans.

Aware of the sources of life that guarantee the existence of the kingdom, let us all take care of the soil and water of our Enchanted Kingdom – The Planet Earth.

Teacher Ana, we want to be our school's junior environmental patrollers and help protect our Enchanted Kingdom, our Planet Earth.



Excellent, my dear students! You are amazing. Cheers to the World Soil Day!

Hooray!



Soil and Water: A Source of Life

For the Enchanted Kingdom to maintain the magic of fairy tales and protect the sources of life, Soil Education must be prioritized throughout all the Planet Earth.

In this way, the world will be able to envision an enchanted kingdom where all citizens have the right to quality food, health, and education, for today and future generations.

In the links below, you can find two booklets awarded in the 2020 and 2022 competitions that cover some of the information mentioned in this booklet in more detail:

1. Special picnic on World Soil Day - <https://www.fao.org/index.php?id=119185&L=2>
2. The Home of Life – I am a living soil <https://ainfo.cnptia.embrapa.br/digital/bitstream/item/222760/1/The-home-of-life-2021.pdf>

Other books awarded in previous competitions:

1. <https://www.fao.org/world-soil-day/about-wsd/wsd-2022/contests/children-booklet-contest-2022/en/>
2. <https://www.fao.org/documents/card/en/c/cb4185en>
3. <https://www.fao.org/documents/card/en/c/cc0530en>

Playing with the colors of soils

Let's play and create art with the sources of life, soil and water! Do you want to know how?

Simple! By making ink that is sustainable and enjoyable to paint.

It's very easy: just mix two parts of sifted soil with one part of PVA white glue and add water little by little until it reaches the desired consistency: thinner or thicker.

That's it! Now all you have to do is find soils of different colors and prepare your special inks and paint your enchanted kingdom.



Drawing to paint

Hello dear readers, how about having fun calling the images to their respective names?



Farmer

Mountains

Carrot

Vegetables

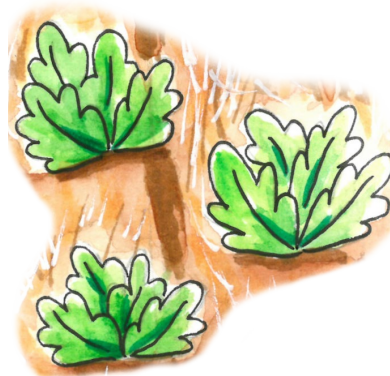
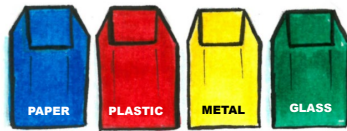
Planet

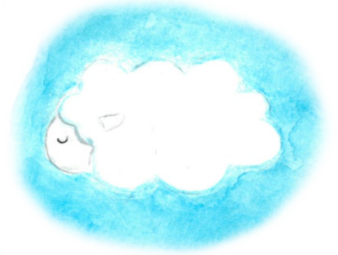
Sun King

Teacher
Ana

Recycling

Rain





Cloud

Fish

Villain

Gabriel

Island

Lettuce

River

Ocean

Corn

Tomato



Hunting words

S T U D E N T S N O W
 C Y A N A T N U A M T
 H T W I W E R U T A N
 O I F A R M E R M N E
 O S A T T R D U O L C
 L R N N U S E L I O S
 P E T U F F S Q C Y A
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 R E E Z R A I N S F A
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 W O R L D D A Y L L T

Farmer
Water
Food
Students
Air
Tree

Boogeyman
Biodiversity
Rain
City
Desert
World Day

Education
Enchanted
Erosion
School
Fountain
Ant

Gabriel
Glacier
Book
Worm
Mountain
Nascent

Nature
Snow
Nutritional
Cloud
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