RESPONSIBLE USE: HOW TO REDUCE WASTE AND PROMOTE RECYCLING?

Digital Educational Mat & Coding







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RESPONSIBLE USE: HOW TO REDUCE WASTE AND PROMOTE RECYCLING?

) Teaching program set-up

7/8

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Scenario

This project is developed in 4 meetings of about an hour each to be completed sequentially. This kit illustrates the practical indications for each activity and the related timing.

In today's world, the importance of reducing resource waste and promoting recycling cannot be overstated, and teaching these values to children is essential for building a more sustainable future. This project, designed specifically for young learners, aims to inspire responsible consumption habits through an engaging and educational story.

The heart of the project is a captivating journey led by a wise and caring grandfather, who takes his grandchildren on a four-part adventure. This fictional story begins with the sowing and cultivation of wheat, allowing the children to witness the effort and resources required to produce something as simple, yet essential, as food. As the wheat is harvested and transported to industries, the children discover how it is transformed into everyday products they recognize and use.

Along the way, the grandfather helps them understand that the choices people make when purchasing products matter, not just for our health, but for the environment too. The importance of selecting products that minimize waste and promote sustainability becomes a key aspect of the thirt lesson.

In the final stage of the journey, the children learn about the significance of proper waste disposal and recycling, as well as the creative possibilities of reusing items instead of discarding them. By the end of this adventure, they are equipped with valuable knowledge about how their actions can reduce waste and help protect the planet. Through this interactive and story-based approach, the project makes learning about responsible consumption and recycling both fun and meaningful.

O Involved subjects





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ART

• Pedagogical needs	 This project, designed for kids aged 7-8, covers several key pedagogical needs that align with their developmental stage and cognitive abilities; Understanding cause and effect. Children learn how choices impact the environment, helping them see the consequences of their actions; Developing environmental awareness. The project introduces basic concepts of sustainability, teaching children the importance of reducing waste and recycling from an early age; Encouraging critical thinking. By discussing product choices and their impact, children start developing decision-making skills; Hands-on learning. Interactive activities, such as sorting waste and recycling, provide practical learning experiences, reinforcing the lessons in a fun, tangible way; Improving social skills. Group activities and discussions enhance communication, collaboration, and teamwork skills; Enhancing problem-solving. The project introduces real-world environmental challenges, encouraging children to find practical solutions, building early problem-solving abilities; Expanding vocabulary. New words related to sustainability and recycling are introduced in a simple, age-appropriate way.
O Pedagogical objectives	 The pedagogical objectives for a project aimed to reduce waste and promote recycling can be outlined as follows: Foster environmental responsibility and empathy for the planet, teaching children the impact of their actions on the environment and instill care and responsibility for protecting natural resources; Promote sustainable habits and teach recycling skills, encouraging daily habits like reducing waste, recycling, and reusing items; Enhance critical thinking and develop problem-solving skills. Help children make informed decisions about product choices and guide them in finding creative solutions to environmental challenges; Strengthen teamwork and communication through group activities, fostering social interaction and collaboration; Introduce new terms related to sustainability, recycling, and consumption, while encouraging children to think holistically about the ecological and nutritional impact of their product choices.
O Methodology	The DEMING CYCLE (PDCA Cycle) is a method for implementing improvements continuously, test changes and solve problems.
	PLAN DO CHECK ACT
	01_Plan and schedule teaching units/activities.

02_Carry out the activities (teaching units; theoretical training sessions; practical training/laboratory sessions).

03_Continuous control that the objectives are achieved and that all students have acquired new skills in a homogeneous way.

04_At the end of each session the teacher evaluates the work, observes and identifies critical issues and ways to implement corrective actions for the future.



FROM SOWING TO EARS OF WHEAT



 \diamondsuit Section of the map

This section of the map is dedicated to the first lesson. On a graphic level it presents all the elements useful for narration and related activities.



> Pedagogical objectives

- Understand the importance of sustainable agricultural practices in the growth of wheat, focusing on how resource management (water, soil, and energy) impacts both the environment and food production;
- Learn the stages of wheat growth sowing, fertilizing, and harvesting - while recognizing the human efforts and natural resources involved in each phase;
- Explore the key factors that affect plant growth, such as pests, light, temperature, and humidity, and understand how each element contributes to the success or failure of crops;
- Investigate how sustainable farming practices can help mitigate the impact of harmful factors (e.g., using organic methods to control pests or conserving water to adapt to climate variability);
- Develop an awareness of the interconnectedness between agriculture, ecosystems, climate and how thoughtful choices in farming can promote both plant health and environmental preservation.

ONECESSARY ASPECTS

The story and its activities require:

- an educator who will actively participate during the lesson;
- a display on which to screen the map during and after reading the story and to view the videos proposed for some activities;
- a computer/tablet with which children can carry out part of the activities and programming on Scratch (a free programming environment, with a graphical programming language).

O Methodology

ATTENTION: Time of correction

A mistake in STEAM is a fundamental moment: all mistakes teach something and from them we can learn and improve together. The error must be corrected in a positive way without any penalty (reprimand, negative judgement, etc.) The correction involves the whole group in searching for the best solutions and explaining the reasons (cooperative learning – collective intelligence).

NARRATION (STEP 1) - 10 min

The educator will read the story. During the narration the map will be projected on a screen and kids will be encouraged to participate.

CODING ON SCRATCH (STEP 2) -THROUGHOUT THE LESSON This part is aimed to introduce block programming on Scratch. All activities will be led by the educator.

TASK 1 / SIMULATION - 15 min

The class will be led by the educator in a simulation of sowing and growing wheat on Scratch.

TASK 2 / SIMULATION - 15 min

Children will be led by the educator in another simulation on Scratch where they have to go through the sown field to remove the pests.

TASK 3 /SIMULATION - 10 min

Children will observe a simulation on Scratch to see how different temperatures affect wheat germination and growth.

SIDE ACTIVITY / SIMULATION AND DISCUSSION - 10 min

The class will observe the sequence of growth stages of wheat on Scratch. They will also discuss what they learned in this lesson.

From sowing to ears of wheat

) Step 1

The educator reads carefully the story to the children encouraging them to participate. The educator will also use this phase to introduce the topics of this lesson: sustainable agriculture, the wheat growth cycle and the importance of environmental factors such as light, temperature and humidity.

Step 2

The educator helps children to carry out the block programming code on Scratch.

TASK 1

To complete this first task the educator will guide the children in the learning path through a simulation on Scratch. Children will digitally sow wheat by dragging icons into the fields. This task will include selecting the type of soil, the depth at which the seed should be placed, and initial fertilization. Grandpa the farmer sat down with his grandchildren, Luca and Sofia, under the big apple tree in the garden. «Today, children, I'm going to talk to you about wheat», Grandpa began. «You know, wheat is one of the most important plants for us. Without it, we wouldn't have bread, pasta or cookies.»

Luca raised his hand enthusiastically. «When do you plant wheat, Grandpa?»

«Wheat is planted in the fall», Grandpa replied. «First of all, we prepare the soil. We plow it to make it soft and ready to receive the seeds. Then, we scatter the seeds in the soil and wait for nature to do its work.»

«But what kind of soil do you need for wheat?» Sofia asked.

«Wheat prefers fertile, well-drained soil» Grandpa explained. «Soil that is too sandy or too clayey is not good. And while we are growing, we have to be careful about pests. Sometimes we use pesticides to protect the plants, but we have to be careful not to use too much so as not to damage the environment.»

«When is the wheat harvested?» Luca asked.

«The wheat is harvested in the summer, when the ears are ripe and golden» said his grandfather. «We use large machines called combine harvesters to cut and separate the kernels from the ears. Then, the kernels are put into bags and prepared for the next trip.»

During this lesson the class led by the educator will use block programming on Scratch following the steps explained in the first chapter of the dedicated additional pamphlet called **MAT9.** Coding literacy for the lessons. The tasks to complete are listed below.

In this phase, the children, guided by the teacher, will have the opportunity to explore the essential factors involved in sowing wheat, such as soil preparation, seed selection, and timing. They will learn how elements like temperature, moisture, and sunlight affect the early stages of plant growth, gaining hands-on knowledge of the process.

The children will also be introduced to the different stages of sowing, from planting seeds to understanding the importance of spacing and soil fertility, fostering a deeper appreciation for the care and effort required in sustainable agriculture.

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TASK 2

Also in this step the educator will guide the children in the learning path through a simulation on Scratch.

The children will observe images of weeds around the wheat that represent pests; by digitally moving through the sown field, they will have the task of removing the pests.

TASK 3

The educator will guide again the children in the learning path through a simulation on Scratch. Children will see how different temperatures affect wheat germination and growth.

SIDE ACTIVITY

To complete this task the educator will guide the children in the learning path through a simulation on Scratch.

Here students will use variables like temperature and humidity to observe how these factors affect growth. In this second phase, children will observe firsthand how various pests, such as insects or fungi, can threaten the growth and health of wheat crops. They will learn to identify common pests and their impact on plants, deepening their understanding of the challenges faced in agriculture.

Guided by the educator, the children will also explore sustainable pest control techniques, such as using natural predators, organic treatments, and crop rotation. This hands-on experience will empower them to understand the importance of protecting crops while minimizing environmental harm, reinforcing the principles of ecofriendly farming.

In this activity, children will explore how temperature plays a crucial role in the germination and growth of wheat. They will learn that the speed of wheat maturation is directly influenced by varying temperatures, with optimal growth occurring between 20°C and 35°C.

Through interactive observation and experimentation, children will discover that wheat germination is possible only within a specific range of 15°C to 31°C, with temperatures between 28°C and 35°C being ideal for robust development.

This activity will help them grasp the delicate balance required for successful crop growth and how farmers must carefully monitor environmental conditions to ensure healthy yields.

In this activity, children will actively track the development of wheat by observing its growth at key intervals: on the 1st day (seed observation), and again on the 6th, 15th, 30th, 50th, and 100th days.

Through this process, they will witness firsthand the fascinating progression of the wheat plant, from its early stages as a seed to its full maturity. Guided by the teacher, the children will sequence the different growth stages—germination, tillering, stem elongation, floral initiation, and maturity—gaining insight into the plant's life cycle. This observation will not only strengthen their understanding of plant biology but also foster an appreciation for the care involved in agriculture.

At the end of this simulation the educator will start a discussion on the topics covered during the lesson, encouraging the kids to participate.



 \diamondsuit Section of the map

This section of the map is dedicated to the second lesson. On a graphic level it presents all the elements useful for narration and related activities.



> Pedagogical objectives

- Comprehend the key steps involved in transporting wheat from the field to industrial processing facilities, including harvesting, storage, and transportation logistics;
- Explore the various modes of transportation used in the supply chain, such as trucks, trains, and ships, and understand their role in ensuring wheat reaches industries efficiently;
- Analyze the environmental footprint of different transportation methods, comparing factors like fuel consumption, emissions, and energy efficiency;
- Assess the economic considerations of transportation, such as cost-effectiveness and accessibility, and how these factors influence the choice of transportation;
- Learn how selecting eco-friendly transportation options can reduce environmental impact, contributing to a more sustainable agricultural system;
- Discover the various processes involved in transforming raw wheat into products used in daily life, such as flour, bread, and pasta;
- Gain insight into the machinery and techniques industries use to process wheat, and understand the importance of efficiency and sustainability in industrial food production.

Necessary aspects

The story and its activities require:

- an educator who will actively participate during the lesson;
- a display on which to screen the map during and after reading the story and to view the videos proposed for some activities;
- a computer/tablet with which children can carry out part of the activities and programming on Scratch (a free programming environment, with a graphical programming language).

• Methodology

ATTENTION: Time of correction

A mistake in STEAM is a fundamental moment: all mistakes teach something and from them we can learn and improve together. The error must be corrected in a positive way without any penalty (reprimand, negative judgement, etc.) The correction involves the whole group in searching for the best solutions and explaining the reasons (cooperative learning – collective intelligence).

NARRATION (STEP 1) - 10 min

The educator will read the story. During the narration the map will be projected on a screen and kids will be encouraged to participate.

CODING ON SCRATCH (STEP 2) - THROUGHOUT THE LESSON

During the lesson children will do block programming on Scratch. All activities will be led by the educator.

TASK 1 / GAME ON SCRATCH - 15 min

After receiving an explanation from the teacher about the various means of transport, the children will play a game on Scratch to test their knowledge on this topic.

TASK 2 /SIMULATION - 20 min

Children will be led by the educator in a simulation of wheat transportation on Scratch. They will also have to adjust some variables in order to make transport optimal.

TASK 3 /DISCUSSION - 10 min

The educator will start a discussion with the children about the transformation of wheat into everyday food products. The class will be appropriately involved.

From harvest to industry

) Step 1

The educator reads carefully the story to the children encouraging them to participate. The educator uses this moment to talk with the children about the main themes of the lesson: the transportation of wheat to the industries and its transformation into derivatives for everyday use. The next day, Grandpa called his grandchildren again. «Today I will tell you how wheat gets from our fields to the factories that transform it into food.»

Sofia snuggled up to Grandpa. «How does wheat travel, Grandpa?»

«Once harvested, the wheat is loaded onto large trucks,» Grandpa explained. «These trucks take it to the mills, where the grains are ground into flour. From the mills, the flour is then sent to the food factories, on trucks or sometimes on trains.»

«And what happens in the factories?» Luca asked.

«In the factories, flour is transformed into many different products,» Grandpa continued. «It is kneaded and cooked to make bread, mixed with other ingredients to make pasta, or perhaps with sugar and butter to make cookies. Each product follows a different process, but they all originate from our wheat.»

) Step 2

The educator helps children to carry out the block programming code on Scratch. During this lesson the class led by the educator will use block programming on Scratch following the steps explained in the second chapter of the dedicated additional pamphlet called **MAT9.** Coding literacy for the lessons. The tasks to complete are listed below.

TASK 1

In this first activity, students will have the opportunity to learn about the main means of transport used to transport grain (trucks, trains, boats, planes).

After a brief explanation, the educator will help the class complete a game on Scretch in which children will have to classify the types of transport based on their efficiency, cost, and environmental impact. In this interactive activity, the educator will guide students in exploring the main means of transport used to move grain from the field to the factories: trucks, trains, boats and planes. Children will first learn about the strengths and limitations of each mode of transport, focusing on factors such as speed, cost and environmental impact.

After this introduction, students will engage in a fun educational game on Scratch, in which they will use the map of this second lesson as a background. Their task will be to evaluate and classify each type of transport by assigning a rating from 1 to 5 stars on five key indicators:

- 1. Speed/time: how quickly can the transport deliver the grain?
- 2. Cost: what is the economic cost of using this method?
- **3. Environmental impact**: how environmentally friendly or polluting is the transport option?

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- 4. Destinations reachable: how can this transport travel and how many destinations can it reach?
- 5. Other: personal considerations based on their own judgments or additional factors (such as reliability or capacity).

Once all students have evaluated the transportation methods, the class will gather for a group discussion to compare their evaluations. They will discuss and analyze the results, considering the balance between speed, cost, environmental impact, and accessibility, to determine the most efficient and sustainable method for transporting grain.

This activity not only improves their understanding of transportation, but also promotes critical thinking, collaboration, and also decision-making skills.

In this activity, students will actively participate in a Scratch simulation that models the transportation of wheat from the field to various destinations. They will be tasked with selecting the most suitable mode of transportation (trucks, trains, boats, or planes) while also adjusting key variables such as distance, travel time, and storage conditions.

Through this hands-on simulation, students will experiment with how these factors influence the quality of the wheat during transport. For example, they will observe how longer distances and extended travel times may affect wheat freshness, or how improper storage conditions can lead to spoilage. The simulation will provide real-time feedback, helping students visualize the direct impact that transportation choices and environmental factors have on the product's quality.

This activity not only deepens their understanding of logistics and supply chains but also encourages critical thinking.

TASK 3

TASK 2

In this step the educator will

guide the children in the

learning path through a simulation on Scratch.

grain transportation. In particular, they will have to

transportation and adapt some variables to make it

choose the type of

optimal.

Students will participate in

the creation of a simulation of

The educator will start a discussion involving children with questions and letting them express themselves by sharing their knowledge on the topic. The educator will initiate an engaging classroom discussion to help students explore the journey of wheat after it arrives in the factories, highlighting how this raw grain is transformed into a wide variety of everyday food products. Through guided questions and visual aids, children will learn that wheat goes through different processing stages to produce products such as flour, bread, pasta, cereals, and even snacks.

The discussion will delve into the specific methods used in industrial food production, such as milling, refining, and cooking, highlighting how wheat is altered to create different textures and flavors.

To make learning more interactive, the educator can introduce examples or product samples, encouraging children to think critically about how these foods are processed and packaged.

By the end of the discussion, students will have a clearer picture of how wheat travels from the field to their plate, gaining insight into the complexity of food production.



🗘 Section of the map

This section of the map is dedicated to the third lesson. On a graphic level it presents all the elements useful for narration and related activities.



Pedagogical objectives

- Understand the significance of mindful shopping habits, focusing on buying only what is needed to prevent unnecessary food waste;
- Develop awareness of how reducing food waste not only conserves resources but also supports global efforts to combat hunger and reduce environmental impact;
- Explore how personal consumption decisions such as choosing sustainably sourced products and reducing packaging waste – can directly influence the environment, including natural resource depletion and pollution;
- Understand the broader consequences of everyday actions on ecosystems and the planet's health, encouraging children to adopt more sustainable lifestyles;
- Learn about the basic nutritional content of frequently purchased foods, such as carbohydrates, proteins, fats, vitamins, and minerals, and how these contribute to a balanced diet;
- Equip students with the knowledge to make healthier food choices by comparing the nutritional benefits of whole foods (for example, whole grains) versus processed items, empowering them to prioritize health alongside sustainability.

Necessary aspects

The story and its activities require:

- an educator who will actively participate during the lesson;
- a display on which to screen the map during and after reading the story and to view the videos proposed for some activities;
- a computer/tablet with which children can carry out part of the activities and programming on Scratch (a free programming environment, with a graphical programming language).

Methodology

ATTENTION:

NARRATION (STEP 1) - 10 min

The educator will read the story. During the narration the map will be projected on a screen and kids will be encouraged to participate.

CODING ON SCRATCH (STEP 2) - THROUGHOUT THE LESSON

During the lesson children will do block programming on Scratch. All activities will be led by the educator.

TASK 1 / SIMULATION AND DISCUSSION - 20 min

The children will be led by the educator in a Scratch simulation set in a supermarket. Here the class will have to "shop" for food, keeping in mind the concept of sustainability. At the end there will be a brief group discussion on the topic.

TASK 2 / SIMULATION - 20 min

The educator will lead an activity where children will plan a shopping list on a budget, focusing on needs versus wants.

TASK 3 /DISCUSSION - 10 min

The educator will initiate a group discussion about what the children have learned in the lesson and how they can practice thoughtful choices in their daily lives.

A mistake in STEAM is a fundamental moment: all mistakes teach something and from them we can learn and improve together. The error mus

Time of correction

improve together. The error must be corrected in a positive way without any penalty (reprimand, negative judgement, etc.) The correction involves the whole group in searching for the best solutions and explaining the reasons (cooperative learning – collective intelligence).

At the supermarket

) Step 1

The educator reads carefully the story to the children encouraging them to participate.

The educator will introduce the theme of the lesson by talking about how different choices can influence the waste of food and natural resources.

A reflection will also be made on the impact of the consumption of packaged products and the importance of more sustainable alternatives. On the third day, Grandpa took his grandchildren to the supermarket. «Today we learn how to choose food consciously.»

Luca and Sofia looked curiously at the shelves full of products. «Grandpa, how do we choose well?»

«First of all,» said Grandpa, «we have to look at the labels. The labels tell us where the food comes from, what it contains and how much it costs. It's important to choose healthy fresh foods and prefer those that come from nearby, because they have traveled less to get here.»

«We must not buy too much,» added Sofia, «so as not to waste.»

«Exactly,» replied Grandpa. «Buying only what we need helps us not to waste food and save money. And when possible, we bring our reusable bags with us so as not to use too much plastic.»

Step 2

The educator helps children to carry out the block programming code on Scratch.

TASK 1

In this first phase, the educator will guide the children in the learning process through a simulation. Specifically, they will have to choose the items based on their needs, avoiding excess to minimize waste.

At the end, a discussion will be started in which the educator's task will be to involve the students with questions about their experiences and ideas. During this lesson the class led by the educator will use block programming on Scratch following the steps explained in the third chapter of the dedicated additional pamphlet called **MAT9.** Coding literacy for the lessons. The tasks to complete are listed below.

In this first activity students will engage in a fun, interactive activity where they simulate a shopping experience at a virtual supermarket. Using this tool, they will be challenged to "buy" food items based on actual needs, carefully selecting quantities to avoid excess and minimize food waste. Throughout the simulation, students must balance their choices, considering what they already have, meal planning, and how to avoid over-purchasing.

As they navigate the virtual aisles, the educator will introduce key discussion points about the benefits of choosing local and seasonal products. Students will learn that buying locally grown food not only supports the local economy but also reduces the carbon footprint associated with transporting goods over long distances. Similarly, selecting seasonal produce helps minimize the energy and resources required for growing out-of-season foods. After the simulation, the class will engage in a reflective discussion about how their purchasing decisions can contribute to sustainability. They will examine how avoiding food waste, choosing local and seasonal products, and being mindful of packaging all play a role in reducing their environmental impact.

This hands-on activity not only teaches students practical skills for everyday conscious shopping but also reinforces the importance of aligning personal choices with ecological responsibility.

TASK 2

The educator will again lead the children in a simulation in which they will have to plan a shopping list taking into account the budget, focusing on needs and not desires. The educator will also have the task of showing the importance of the nutritional values of some of the nost commonly purchased products in the supermarket, also using the tables present in the map of this lesson.

TASK 3

The educator will start a discussion involving children with questions and letting them express themselves by sharing their knowledge on the topic. For this activity each student will receive a fictitious budget and a list of essential needs, simulating the real-world challenge of managing limited resources. The goal is for students to plan their purchases strategically, selecting food items that meet their basic nutritional requirements while staying within their assigned budget.

As they make their selections, students will be encouraged to prioritize foods that offer the highest nutritional value, such as fresh produce, whole grains, and protein-rich items, rather than opting for cheaper, processed foods that may lack essential nutrients. They will need to consider factors such as portion sizes, meal planning, and how to stretch their budget to provide balanced meals over multiple days.

After completing the activity, the class will reflect on the importance of budgeting wisely, how their choices can influence both health and sustainability, and the challenges of balancing cost with nutritional quality in real-life shopping scenarios.

This activity not only teaches practical budgeting and planning skills but also reinforces critical thinking around nutrition and responsible consumption.

In this group discussion, students will engage in a thoughtful conversation about how their everyday food choices can significantly impact both food waste and the preservation of natural resources. The discussion will begin with an exploration of how certain habits, such as over-purchasing, improper meal planning, or not consuming food before it spoils, contribute to unnecessary waste. Students will reflect on the ripple effect of these choices, including the waste of water, energy, and labor used in the production and transportation of food.

The conversation will then shift to the environmental implications of packaged products. Students will analyze how excessive packaging particularly plastic and non-recyclable materials—adds to landfill waste and pollution, affecting ecosystems and wildlife. The group will also discuss the energy and resources required to produce and dispose of such packaging, highlighting the broader environmental costs.

Finally, the discussion will focus on the importance of making more sustainable choices, such as opting for products with minimal or eco-friendly packaging, choosing fresh and local foods, and supporting brands that prioritize sustainability. Through this reflection, students will gain a deeper understanding of how simple, mindful decisions can reduce waste, conserve resources, and contribute to a healthier planet.

This activity not only encourages students to think critically about their consumption habits but also empowers them to take actionable steps toward more sustainable living.



 \diamondsuit Section of the map

This section of the map is dedicated to the fourth lesson. On a graphic level it presents all the elements useful for narration and related activities.



> Pedagogical objectives

- Understand the different types of waste (organic, recyclable, nonrecyclable) and the importance of properly separating them to minimize landfill use and pollution;
- Explore the specific phases of the recycling process, from collection and sorting to reprocessing and manufacturing new products, learning how materials like plastic, glass, paper, and metal can be transformed into reusable resources;
- Recognize the environmental and social benefits of recycling, including conserving natural resources, reducing energy consumption, and lowering carbon emissions;
- Learn the value of reusing materials and products, distinguishing it from recycling by understanding how reusing items in their original form reduces the need for raw materials and manufacturing energy;
- Explore creative and practical ways to repurpose items, such as turning everyday objects into new tools, toys, or household items, encouraging resourcefulness and innovation;
- Evaluate the environmental and economic impacts of reusing, understanding how it contributes to waste reduction, minimizes consumption, and promotes a circular economy.

Necessary aspects

The story and its activities require:

- an educator who will actively participate during the lesson;
- a display on which to screen the map during and after reading the story and to view the videos proposed for some activities;
- a computer/tablet with which children can carry out part of the activities and programming on Scratch (a free programming environment, with a graphical programming language);
- used objects of various kinds, pencils, scissors and glue.

• Methodology

ATTENTION: Time of correction

A mistake in STEAM is a fundamental moment: all mistakes teach something and from them we can learn and improve together. The error must be corrected in a positive way without any penalty (reprimand, negative judgement, etc.) The correction involves the whole group in searching for the best solutions and explaining the reasons (cooperative learning – collective intelligence).

NARRATION (STEP 1) - 10 min

The educator will read the story. During the narration the map will be projected on a screen and kids will be encouraged to participate.

CODING ON SCRATCH (STEP 2) - THROUGHOUT THE LESSON

During the lesson children will do block programming on Scratch. All activities will be led by the educator.

TASK 1 / SIMULATION AND DISCUSSION - 20 min

The educator will lead the children in a simulation that aims to teach them the importance of recycling. This activity will be supported by a final discussion in which the children will be appropriately involved.

TASK 2 /DISCUSSION - 10 min

The educator will start a group discussion on ingenious ways to reuse some discarded items instead of throwing them away, teaching them how reusing can reduce waste.

TASK 3 / PRACTICAL ACTIVITY - 20 min

For this activity, children will be involved in creating artistic or utilitarian objects using discarded or used materials.

The world of recycling

) Step 1

The educator reads carefully the story to the children encouraging them to participate. The educator uses this moment

to talk about the importance of recycling and reusing for the health of the planet.

Step 2

The educator helps children to carry out the block programming code on Scratch.

TASK 1

For this first activity, children will be guided through a waste separation simulation. They will learn to recognize and separate the different types of waste, delving into the phases of recycling and reflecting on the importance of correct separation. On the last day, Grandpa gathered his grandchildren around the kitchen table. «Today we're going to talk about recycling and reusing.»

«Grandpa, what should we do with the waste?» Sofia asked.

«We have to separate it properly,» Grandpa explained. «Glass, plastic, paper, and organic waste go in different containers. This helps reduce pollution and allows us to recycle materials to make new products.»

«And what can we reuse?» Luca asked.

«We can reuse many things,» Grandpa said. «Glass jars can become containers for homemade jam, cardboard boxes can be used for our toys, and old clothes can become rags for cleaning. Every time we reuse something, we help protect our planet.»

The grandchildren smiled, ready to put into practice everything they had learned. And the farmer grandfather, proudly, observed them knowing that he had sown in them the seeds of awareness and respect for nature.

During this lesson the class led by the educator will use block programming on Scratch following the steps explained in the fourth chapter of the dedicated additional pamphlet called **MAT9.** Coding literacy for the lessons. The tasks to complete are listed below.

In this waste separation simulation, students will engage in a hands-on activity designed to help them learn how to accurately identify and separate different types of waste, such as plastic, paper, metal, and glass. Through interactive role-play or digital simulation, children will sort various waste items into their appropriate recycling bins, reinforcing their understanding of waste categories and the importance of proper disposal practices.

After the simulation, the educator will lead a discussion on the final destination of the collected materials, explaining how each type of waste is processed and transformed once it reaches recycling facilities. Students will explore how materials like plastic can be melted and reshaped, paper can be pulped and reused, and metals and glass can be smelted and formed into new products.

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This discussion will emphasize how correct waste separation at the source is crucial for ensuring that recyclables are effectively processed, preventing contamination that could render an entire batch of materials unusable.

The discussion will also cover the phases of the recycling process, from collection and sorting to cleaning, processing, and remanufacturing. Students will learn how each step plays a vital role in turning discarded materials into new products, reducing the need for virgin resources. Through this activity, students will not only develop practical waste management skills but also gain a deeper appreciation for how recycling contributes to environmental sustainability, energy conservation, and resource preservation.

This comprehensive simulation and discussion will empower students to become more mindful of their waste disposal habits and understand the significant impact proper recycling has on protecting the planet.

TASK 2

The educator will start a discussion involving children with questions and letting them express themselves by sharing their knowledge on the topic. In order to make the explanation clearer, if necessary, the educator can optionally start the simulation on Scratch. In this phase, students will work together to brainstorm creative and innovative ways to reuse discarded items that would otherwise end up in the trash. The class will be introduced to various common discarded items, such as plastic bottles, cardboard boxes, old newspapers, or cans, and encouraged to come up with practical or artistic ways to reuse these materials. The focus will be on transforming "waste" into useful items, such as turning old bottles into plant pots, making cardboard toys, or making storage containers out of cans. The conversation will also highlight how reusing items not only reduces the amount of waste that ends up in landfills, but also reduces the demand for new resources and energy-intensive production processes.

The educator will guide students through the concept of the circular economy, in which products and materials are kept in use for as long as possible, and the role that reuse plays in this sustainable model. By reflecting on their creative solutions, students will gain insight into how everyday objects can have a second life, reducing waste, saving resources, and promoting green habits.

This activity promotes critical thinking, problem solving, and environmental responsibility, encouraging students to think outside the box and recognize the impact that small changes can have on reducing waste and protecting the planet.

TASK 3

The educator will help the children to complete this artistic activity which has the objective of creating utilitarian objects using discarded materials.

The educator will provide all the necessary creative materials.

In this practical reusing activity, students will have the opportunity to turn recyclable materials into artistic or functional objects, combining creativity with sustainability. Using everyday items such as plastic bottles, cardboard, paper, old clothing, tin cans, and glass jars, the children will work individually or in groups to craft new objects whether decorative, like colorful vases or sculptures, or utilitarian, such as homemade organizers, planters, or pencil holders. Throughout the hands-on project, the educator will guide students in thinking about the practical applications of the materials, encouraging them to consider how their designs can serve a purpose beyond aesthetics. For example, students might create bird feeders from plastic bottles or reusable shopping bags from old T-shirts, demonstrating how discarded items can be transformed into something valuable and long-lasting. Once the objects are completed, the class will engage in a discussion about how reusing materials can significantly reduce waste. The conversation will focus on how reusing items extends their lifecycle, preventing them from entering landfills and reducing the need for producing new products, which often involves energy-intensive processes. The students will also reflect on the environmental and economic benefits of reusing—such as conserving resources, reducing pollution, and saving money—and how this practice can easily be integrated into their daily lives.

This activity not only reinforces the importance of waste reduction but also sparks imagination and problem-solving, showing students that sustainability can be both fun and impactful. By physically creating new items from recyclables, students will gain a hands-on appreciation for how small, mindful actions can make a big difference in protecting the environment.

PARTNERS



) Main partners



PORTUGAL

The Agrupamento de Escolas Miguel Torga is a school located in Bragança, Portugal, an inland city of the country. The school consists of three buildings, two for preschool and elementary school and one for secondary and high school. There are 88 teachers, 2 psychologists and also a speech therapist.



ITALY

Sapienza University of Rome, (Department of Planning, Design, Technology of Architecture). Sapienza was founded by Pope Boniface VIII in 1303. It's one of the oldest universities in the world and the second largest University in EU, with 11 faculties, 63 departments, 111.000 students and more than 4.700 professors.

🗘 All partners



ITALY The CISL Scuola (Confederazione Italiana Sindacati Lavoratori - Scuola) is the union of the staff of primary and nursery schools, secondary schools and vocational training of the CISL. It was founded in 1997 by the union of SINASCEL (National Union Elementary School) and SISM (Italian Union of Middle School).



ITALY

Pixel is an education and training institution based in Florence (Italy). Pixel was founded in 1999. Pixel's mission is to promote an innovative approach to education, training and culture, this is done mostly by trying to exploit the best potential of ICT for education and training.



ROMANIA

EuroEd Primary School includes a Kindergarten and a primary school. Both are accredited by the Romanian Ministry of Education. It promotes the EU dimension of education and it also encourages multiculturalism and multilingualism by providing education to children of different nationalities or ethnic groups.



SPAIN

Esciencia is an SME based in Zaragoza established in 2006 as a spin-off of the University of Zaragoza. Esciencia Eventos Cientí icos S.L. is dedicated to the management and organization of science dissemination projects. The company offers both consulting services and the design of educational programs.



BULGARIA

Zinev Art Technologies Ltd. is a company developing, implementing and managing European projects and providing consultations in the spheres of culture, art, Internet-based activities and education, VET, e-learning and school education development, as well as regional development.





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