

# ***U-GROW EDUCATIONAL PROGRAMME AND METHODOLOGY***

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Co-funded by  
the European Union

## U-GROW Educational Programme and Methodology

Published by: DOVES Association - FEE Slovenia, Eco-School Programme Slovenia

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First edition: Portorož, 2026

Electronic edition

Free publication

The publication is available at the following link:

<https://ekosola.si/cofarm4cities/>

U-GROW Educational Programme and Methodology were developed as part of the CoFarm4Cities project. The project is financially supported by the Interreg Central Europe program with cofinancing from the European Regional Development Fund (ERDF).

In collaboration with



Mestna občina  
Ljubljana

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Kataložni zapis o publikaciji (CIP) pripravili v Narodni in univerzitetni knjižnici v Ljubljani

COBISS.SI-ID 275954947

ISBN 978-961-7111-21-7 (PDF)

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# Foreword

Have you ever wondered how our diet affects the environment? **Every bite of food we eat carries its own story** – from production methods and transportation to packaging and the waste created along the way. In today's lifestyle, sustainable nutrition is becoming an increasingly important topic – one worth exploring, understanding, and bringing into the educational process.

Through the **U-GROW educational programme**, presented here, we will explore together with students how eating habits influence the environment and how even small changes can reduce our carbon footprint.

Using research tasks, interactive workshops, and experiential activities, we will discover:

- how food makes its way to our plates;
- the role of production, transport, and packaging;
- how to reduce food waste;
- what local and seasonal eating means;
- how (locally produced) food affects our health;
- what challenges local self-sufficiency faces in urban environments;
- and how each of us can contribute to a more sustainable lifestyle.

Our food choices are not just personal decisions – they are actions that affect the whole planet. **Join us on this journey** of exploration, learning, and change. Together we can help students understand the world around them and equip them with knowledge and values for a sustainable future.

**GREGOR CERAR**, NATIONAL COORDINATOR OF THE ECO-SCHOOL PROGRAMME  
SLOVENIA

A vibrant garden scene with various plants and a basket of fresh vegetables. The background is filled with green foliage and orange flowers. In the foreground, a hand is seen holding a woven basket filled with fresh produce, including a red tomato, green beans, and a cucumber. The overall atmosphere is bright and natural, suggesting a focus on sustainable agriculture and education.

## CHAPTER 1

# ***Sustainable Urban Farming in Education: From Challenges to Solutions***

Students introduced to sustainable practices early – and who understand their impact on the environment - are better equipped to develop a responsible attitude toward nature and become drivers of positive change.

## 1.1

### ***Challenges of the Urban Environment and the Importance of Sustainable Urban Farming***

**Modern cities** in Central Europe and around the world are facing growing pressure on land due to **rapid urbanization**. This leads to a loss of biodiversity, threatens soil fertility, and affects the long-term sustainability of food systems. At the same time, the **need for local food self-sufficiency is increasing**, which can be seen in the rising popularity of community gardens where residents grow food for their own needs.

Pupils, especially those from highly urbanized areas, often have little understanding of farming, nature, and environmental challenges. Yet they are the ones who directly experience the effects of climate change, such as heat waves, air pollution, floods, and declining biodiversity. In this context, **sustainable urban farming** offers many solutions: it helps cool urban environments, improves air quality, supports biodiversity, encourages local food production, and reduces the carbon footprint of urban food systems.

For a stable and sustainable future, **we need to act now** – and the key to change lies in education. Children who learn about sustainable practices early on and understand their impact on the environment are more likely to develop a responsible attitude towards nature and become drivers of positive change.

## 1.2

### ***The CoFarm4Cities Project – An Opportunity for a Sustainable Future***

The **CoFarm4Cities** project was created with the aim of developing a sustainable model of urban farming. Its goal is not only to grow food in cities, but also to reduce the carbon footprint, strengthen the resilience of cities to climate change, and bring local communities together.

As part of the project, the **DOVES FEE – Slovenia** association developed the **U-GROW educational programme** for pupils, along with methodological support for teachers. The program helps children understand sustainable development and the **importance of seasonal, locally grown food**. One of its key strengths is its practical approach – through work in urban school gardens, pupils gain valuable hands-on experience that connects directly with both learning goals and everyday life.

The program can be included in regular lessons as well as in extended activities. Its long-term aim is to change attitudes towards food, improve eating habits,

reduce food waste, and strengthen cooperation between schools and the local community. cooperation between schools and the local community.

In developing the program content, we followed the Slovenian primary school curriculum, the **Sustainable Development Goals** (SDGs), the principles of Education for Sustainable Development (ESD), and well-established pedagogical approaches such as the Deming PDCA (Plan-Do-Check-Act) cycle, Montessori pedagogy, project-based learning, and cross-curricular integration. We also drew inspiration from best practices of the international Eco-Schools programme.

## 1.3

### ***Urban Farming in Education – Teachers as Agents of Change***

Urban farming and school gardens are becoming an increasingly important part of education, as they give pupils direct contact with nature. **School gardens are** not only places for growing food – they are **outdoor classrooms** where children learn about food self-sufficiency, sustainable development, and the responsible use of natural resources.

As teachers, you play a key role in this process. With innovative and inclusive teaching methods, you can encourage critical thinking, responsible behavior, and a love of nature.

**TO SUPPORT YOU IN THIS WORK, WE HAVE PREPARED SEVERAL TEACHING TOOLS:**

1. **Urban school garden, a teacher's guide** – includes guidelines, gardening facts, and practical activity ideas that can be linked to the curriculum.
2. **Gardening Journal** – for recording and monitoring activities in the school garden.
3. **Gardening Etiquette** – ten recommendations for appropriate behaviour in school and community gardens.



The educational programme is designed as modules and covers six key areas:

1. Food Self-Sufficiency
2. Environment and Biodiversity
3. Waste Reduction and Circular Economy
4. Development of Social Skills
5. Sustainable Mobility
6. Energy

**The modular approach provides flexibility** – teachers can select content according to students' interests, the season, or available time. Each module includes implementation guidelines, clearly defined objectives, a set of activities, suggestions for further tasks, materials, and resources for deepening knowledge.

The modules are interconnected and build on each other, giving students a comprehensive understanding of sustainability topics.

Special attention is given to identifying relevant themes. With the help of keywords, teachers can easily find materials or topics of interest (e.g., “biodiversity,” “quiz”) or those aligned with their curriculum and integrate them into lessons. This approach supports gradual knowledge building, connects theory with practice, and strengthens competencies that will accompany students throughout their lives.

## 1.4

### ***A Holistic Approach to Learning for a Sustainable Future***

The U-GROW programme, its educational modules, and the explanation of key concepts of sustainable urban agriculture form a holistic learning model with a clear purpose: **to empower teachers and educate generations of young citizens who will become ambassadors of change**: promoting more sustainable eating habits, protecting the environment, and strengthening local connections.

As initiators of change, **teachers play a vital role** in bringing sustainable practices into the school environment. Yet ideas alone are not enough. What is needed is a thoughtful, structured, and long-term approach. This is where the U-GROW methodology comes in: **a multi-level model for developing urban school gardens**, offering schools practical tools, support, and teaching resources for introducing urban agriculture gradually into everyday educational practice.

## 1.5

### ***Objectives of the Educational Programme and Methodology***

- To change the attitudes of children and their families towards food production and to encourage prioritizing locally grown and seasonal food.
- To establish urban school gardens as sustainable learning spaces in primary schools.
- To raise awareness of the importance of seasonal diets, organic farming, and the environmental impact of food choices.
- To educate young people to develop a responsible attitude towards food, natural resources, and their communities.

## 1.6

### ***Core Pedagogical Approaches***

The programme and methodology are based on modern teaching strategies that encourage active learning, collaboration, and the transfer of knowledge into everyday life:

- **Experiential learning** – learning through direct experience: planting, observing natural processes, producing, and preparing and consuming food.
- **Project-based learning** – working on comprehensive tasks such as designing a school garden, observing plant growth, or preparing a sustainable meal.
- **Collaborative learning** – group work strengthens teamwork, communication skills, and a sense of responsibility.
- **Inquiry-based learning** – formulating questions, conducting experiments, analysing data, and presenting findings.
- **Interdisciplinary learning** – integrating different subjects (biology, home economics, science, geography, language education, etc.) to gain a holistic understanding of sustainability concepts.
- **Problem-based learning** – addressing real-life challenges from the environment (e.g., reducing food waste, improving soil quality, finding local solutions).

**THESE APPROACHES ENABLE STUDENTS TO DEEPEN THEIR KNOWLEDGE, DEVELOP CREATIVITY, CRITICAL THINKING, AND ENVIRONMENTAL AWARENESS.**

## 1.7

### ***Target Groups***

The main target group of the programme and methodology are primary school teachers, who will transfer knowledge and materials to students and integrate sustainability topics into regular lessons as well as extracurricular activities.

**The programme is adapted to all three stages of primary education:**

- First stage (Grades 1-3) – discovering nature through play, observation, and simple hands-on experiences.
- Second stage (Grades 4-6) – deeper exploration of sustainability topics and understanding the food chain.
- Third stage (Grades 7-9) – connecting theory and practice, developing critical thinking, and designing sustainable solutions.

In addition to teachers and students, the programme also addresses parents and the wider local community, since their involvement is essential for long-term success, intergenerational knowledge transfer, and the development of a culture of local food self-sufficiency. By engaging different generations of stakeholders, the programme reaches beyond school walls and fosters intergenerational ties and community learning.

## 1.8

### ***Materials and Teaching Aids***

To support easier and more effective implementation of the educational programme and methodology, we have prepared a variety of didactic materials and teaching aids that assist teachers in their instruction and engage students in active and creative learning.

**The programme offers:**

- Worksheets that enable students to participate actively, record observations, and consolidate knowledge independently.
- Quizzes to check understanding of the content in a fun way.
- Experiment guidelines that guide students in exploring soil, water, plants, and environmental impacts.
- Creative teaching aids that encourage exploration, creativity, and the development of practical skills (e.g., cards, games, poster templates).

**All materials are designed to engage students, motivate them to explore, and provide an interactive and dynamic learning experience.**

## 1.9

## ***Collaboration with Parents and the Local Community***

For the long-term impact of the programme and methodology, the involvement of parents and the local community is essential. Their support ensures that sustainable values extend beyond the classroom and become part of the everyday lives of children and their families. Parents can reinforce sustainable habits through small but meaningful actions, such as urban gardening, using local, seasonal food in home cooking, reducing waste, or choosing sustainable modes of transport. Their participation in school activities – such as fairs, bazaars, cooking workshops, or home challenges – strengthens family bonds and encourages a responsible attitude toward food and the environment.

The local community adds special value to the programme by enabling cooperation with local producers, knowledge exchange, and events that connect different generations. Visits to local farms and markets give students insight into the real-life work of producers while also supporting the local economy.

**WHEN TEACHERS, STUDENTS, PARENTS, LOCAL FARMERS, AND THE WIDER COMMUNITY JOIN FORCES, THE PROGRAMME GOES BEYOND THE CLASSROOM. IT BECOMES A MOVEMENT FOR SUSTAINABLE LIVING AND A FOUNDATION FOR A FUTURE CULTURE OF LOCAL FOOD SELF-SUFFICIENCY, ENVIRONMENTAL RESPONSIBILITY, AND CONNECTION WITH NATURE.**





**CHAPTER 2**

***The Multi-Level  
Model for Developing  
an Urban School  
Garden***

The multi-level model of the U-GROW educational programme enables schools to progress gradually – from initial exploration and planning to greater self-sufficiency and cooperation with local producers.

## 2.1

### ***Sowing the Future: How School Gardens Shape Sustainable Communities***

In today's age of rapid consumption and globalization, we are becoming increasingly disconnected from the sources of our food. **Children and young people often lack the opportunity to understand where food comes from**, how it is produced, and why local production is vital for both the environment and health. The U-GROW programme offers a solution by gradually introducing urban school gardens, it **enables experiential learning** where food becomes the central teaching tool and the schoolyard transforms into a dynamic outdoor classroom.

School gardens are not just spaces for growing vegetables, but **living laboratories** where students, through hands-on work, acquire knowledge in different fields. At the same time, they develop social skills, responsibility, and respect for nature. Through the multi-level model of urban garden development, the **U-GROW programme supports schools in moving step by step** from the initial phase of exploration and planning to food self-sufficiency and cooperation with local producers.

The model is **adaptable**, allowing each school to implement it according to its spatial, logistical, and staffing capacities. Schools without a garden can start at the basic level, while those with existing gardens can expand and integrate the programme into school meals.

The transition to local, seasonal, and sustainable food supply is not only an ecological choice, but also a responsible step towards a healthier and more self-sufficient future.

## 2.2

### ***The Multi-Level Model of Urban Garden Development in the U-GROW Programme***

The U-GROW programme is an innovative model that enables schools to **gradually implement** urban gardening and related sustainable practices. Its systematic, **multi-level approach** adapts the learning process to the individual capacities of schools and promotes greater food self-sufficiency.

At the core of the model is **collaboration** between students, teachers, local farms, and nutrition experts. The aim is for students to understand the entire process of food production and processing, to learn how to prevent food waste, and to develop a responsible attitude towards nutrition.

## 2.3

### *Methodological Framework*

#### THE PROGRAMME IS BASED ON:

- The Deming PDCA cycle (Plan-Do-Check-Act), which enables continuous improvement of gardening and nutrition activities.
- Project-based learning methods, where students actively participate in designing and maintaining the garden.
- Interdisciplinary connections, integrating science, social studies, arts, and technology.
- Community collaboration, as the school garden becomes part of the wider food system and connects schools with local farms.

To enable schools to progress gradually from the first steps of gardening to food self-sufficiency, the U-GROW programme follows five key stages. Each stage represents an important step on the path from an idea to a sustainable urban garden, allowing schools to develop according to their capacities, available space, and level of community involvement.



## Key for Classifying Schools into Stages

### Stage 1: IMAGINARY GARDEN

School without a garden with initial interest.

Exploring sustainable nutrition, urban agriculture, and making the initial plans.

### Stage 2: SMALL GARDEN

School with a basic garden and initial activities.

Soil preparation, setting up infrastructure, and the first crops.

### Stage 3: DIVERSE GARDEN

School with an active garden integrated into teaching.

Students take care of the garden, track plant growth, and engage in scientific research.

### Stage 4: CONNECTED GARDEN

School with an expanded garden and active community involvement.

The school uses produce in meals, collaborates with farms, and organizes school markets.

### Stage 5: SELF-SUFFICIENT GARDEN

School with a high level of food self-sufficiency.

The school achieves a strong level of self-reliance in food production and mentors other schools.



## ***First Stage: Imaginary Garden***

### **FROM IDEA TO VISION: EVERY GARDEN IS FIRST BORN IN THE IMAGINATION.**

At this stage, the school does not yet have a physical garden, but actively explores sustainable nutrition, urban agriculture, and plans for a school garden. Together with mentors, students set goals, explore possibilities, and establish initial connections with local farms and community gardens.

#### ***KEY ELEMENTS:***

##### **Establishing a project group**

- Involving teachers, students, parents, school kitchen staff, and the wider community.
- Appointing a programme coordinator and distributing roles.

##### **Education on sustainable nutrition and urban agriculture**

- Introductory workshops on the importance of local food, seasonality, and food self-sufficiency.
- Learning about sustainable practices (composting, permaculture, organic gardening).

##### **Space analysis and planning**

- Initial identification of potential garden locations (schoolyard, raised beds, indoor growing area, etc.).
- Assessing access to water, sunlight, and soil quality (if needed, in cooperation with experts).
- Students prepare proposals on what they would like to grow and why.

##### **Collaboration with farms/producers and community gardens**

- First visit to an urban community garden (students experience urban agriculture in practice).
- Cooperation with local producers (visits, trainings, and workshops).

##### **Creating a “Garden Charter”**

- Group agreement on garden values (respect for nature, cooperation, responsibility).
- Preparing visual materials (posters, video presentations, school exhibitions).

#### ***INDICATORS OF SUCCESS:***

- **A project group** with clearly defined roles is established.
- **Introductory workshops** on sustainable nutrition and urban gardening are held.
- **A space analysis** with potential locations is completed.
- **The first visit to a community garden** and connection with farms/producers takes place.

- A “**Garden Charter**” is created, defining the values and rules of the school garden.
- **The first draft of the garden plan**, with ideas for planting and spatial organization, is prepared.

### **CLASSIFICATION KEY FOR THIS STAGE:**

#### **A school belongs to this stage if:**

- it does not yet have a garden, but is planning to establish one;
- teachers and students have researched sustainable gardening;
- introductory workshops on sustainable nutrition and urban agriculture have been conducted;
- a basic space analysis has been carried out (sunlight, water access, soil quality);
- the project group has defined garden goals and core values;
- the school has visited a community garden and connected with local farms/producers.

### **IDENTIFICATION OF THE SCHOOL GARDEN STATUS:**

#### **At this stage, the school does not yet have a school garden, but has:**

- explored the importance of urban gardening and sustainable nutrition;
- defined goals for the future school garden;
- established cooperation with farms and community gardens;
- formed a project team and assigned initial tasks.

**Next step: The school progresses to Stage 2 once it prepares a detailed garden plan and begins with the first planting.**

## 2.3.2

### **Second Stage: Small Garden**

#### **ESTABLISHING THE GARDEN: THE SOIL IS PREPARED, THE FIRST SEEDS ARE SOWN.**

At this stage, the school moves from planning to the actual establishment of an urban school garden. Students and teachers prepare the land, set up basic infrastructure, plant the first crops, and begin practical gardening activities.

#### **KEY ELEMENTS:**

##### **Soil and space preparation**

- Cleaning and preparing the land for cultivation.
- Deciding on the type of garden (raised beds, ground beds, vertical gardens, hydroponics).
- Soil analysis (students explore soil structure and fertility).
- Setting up basic infrastructure: beds, paths, access points, spaces for students, etc.

##### **Implementation of basic sustainable solutions**

- Installing a compost bin for organic waste.
- Setting up a rainwater collection system for sustainable irrigation.
- Encouraging biodiversity – planting flowers for pollinators, building insect hotels, and installing birdhouses.

## Planting the first crops

- Selecting seasonal and local plant species (students research and learn about their suitability).
- Experimental plantings – comparing different growing methods (seeds vs. seedlings, sunny vs. shady location, etc.).
- First activities in sensory learning – observing plant shapes and growth, smelling, touching, tasting.

## Integrating the garden into the learning process

- Linking at least two subjects (e.g., biology – plant growth; chemistry – soil pH; mathematics – measuring growth).
- First documentation of plant growth (students keep a garden journal).
- Cooperation with the school kitchen (kitchen staff and students jointly plan the first use of produce in meals).

## Collaboration with farms/producers and community gardens

- Second visit to a community garden (students gain additional practical knowledge).
- Inviting local producers (educational workshops, presentations of farming equipment).
- Students gain practical experience with farming activities.
- Possibility of purchasing seedlings and seeds from local/organic farms (supporting local production).

## INDICATORS OF SUCCESS:

- **A garden with basic infrastructure is established** (soil prepared, paths set, first planting completed).
- **At least three garden beds are installed**, adapted to the needs of students and available space.
- **Students actively participate** in the garden as part of at least two subjects.
- **The first practical workshop is held**, addressing one of the key aspects of gardening: sowing the first crops, soil analysis, or use of sustainable water sources.
- **Cooperation with the school kitchen** is established (a plan for the first use of produce in school meals is developed).

## CLASSIFICATION KEY FOR THIS STAGE:

### A school belongs to this stage if:

- it has established and/or renovated the garden space and prepared basic infrastructure;
- at least three garden beds are in place;
- students have carried out the first planting;
- the learning process is connected with at least two school subjects;
- the school cooperates with the school kitchen and plans to use garden produce;
- the second visit to a community garden has taken place.



## **IDENTIFICATION OF THE SCHOOL GARDEN STATUS:**

### **At this stage, the school:**

- has basic infrastructure for the school garden;
- has completed the first planting and completed the first practical activities;
- is starting to collaborate with local producers and community gardens;
- is developing initial proposals for linking the garden to school meals.

**Next step: The school progresses to Stage 3 when students take on greater responsibility for maintaining the garden and begin conducting their first experiments.**

### 2.3.3

## **Third Stage: Diverse Garden**

### **INTEGRATION INTO THE LEARNING PROCESS: THE GARDEN AS AN OUTDOOR CLASSROOM.**

At this stage, the garden becomes more than just a place for growing plants – it transforms into an outdoor classroom where students, through hands-on experiences, explore natural processes, the food chain, and sustainable agriculture.

Teachers use the garden as a pedagogical tool across multiple subjects, while students monitor and document plant growth, conduct experiments, and engage in sustainability projects. The school builds closer cooperation with local farms. Produce is used in home economics lessons and occasionally in the school kitchen.

### **KEY ELEMENTS:**

#### **Integrating gardening into the learning process**

- Linking gardening activities with at least three subjects (biology, chemistry, geography, art, mathematics, languages, etc.).
- Math activities in the garden: measuring plant growth, calculating bed areas, ratios for mixing fertilizers, etc.
- Language and arts connections: students write plant diaries, create poems, stories, and artworks inspired by nature.
- Experimental learning: monitoring the effects of ecological practices on plant growth, testing different fertilizers, comparing watering techniques.

#### **Practical workshops**

- Learning about plant cycles (germination, growth, flowering, harvesting).
- Identifying local and invasive plant/animal species.
- Natural methods of plant protection: using bio-insecticides, beneficial insects, monitoring pollinators.
- First activities at food processing (e.g., drying herbs, pickling cucumbers, fermenting cabbage, making vinegar, butter, or herbal spreads).

#### **Collaboration with local farms**

- Farm visits: students learn about animal husbandry, fruit growing, and crop production.
- Exchange of seeds and seedlings with farmers and other schools.

- Involvement of farmers as mentors: sharing knowledge about sustainable farming, biodiversity, and the circular economy.
- Establishing a school learning plot on a farm (students help with planting, harvesting, and crop care).
- Joint projects: reducing food waste at school, analysing the food carbon footprint, tackling agricultural-climate challenges.

### Linking the garden to school meals

- First meals made from garden produce (students participate in cooking in the home economics classroom).
- Sensory workshops: tasting, smelling, touching, identifying different types of food.
- Developing sustainable menus: students work with kitchen staff and mentors to create seasonal recipes and sustainable food practices.

### INDICATORS OF SUCCESS:

- **Gardening is integrated into the curriculum** and connected with at least three subjects.
- **As many students as possible actively participate** in gardening activities and keep a garden journal.
- **The first produce is used in lessons** (e.g., home economics, biology, science) or in the school kitchen.
- **Partnerships with local farms/producers** are established.
- **At least one joint project** with a farm or community garden is implemented.
- **A sensory or cooking workshop** linked to school meals is organized.

### CLASSIFICATION KEY FOR THIS STAGE:

#### A school belongs to this stage if:

- It has an active school garden used as an outdoor classroom;
- teachers integrate at least three subjects into garden activities;
- students regularly participate in gardening tasks;
- produce is used in home economics or school meals;
- the school cooperates with local farms or community gardens;
- at least one practical workshop related to organic farming or sustainable nutrition has been held.

### IDENTIFICATION OF THE SCHOOL GARDEN STATUS:

#### At this stage, the school:

- regularly uses the garden as part of the learning process;
- connects multiple subjects through practical activities;
- begins using produce in lessons and meals;
- actively collaborates with farms and the local community.

**Next step: The school progresses to Stage 4 when it begins wider cooperation and deeper integration into the school food system.**

## **Fourth Stage: Connected Garden**

### **COMMUNITY SELF-SUFFICIENCY AND SUSTAINABLE NUTRITION.**

At this stage, the school garden extends beyond the school's boundaries and becomes an important part of both the school's food system and the local community. Students not only grow crops, but also learn about the entire process of food production, processing, and distribution. The school actively cooperates with farms, organizes Green Markets, hosts educational workshops, and mentors other schools in developing and maintaining their own gardens.

### **KEY ELEMENTS:**

#### **Regular use of garden produce in school meals**

- Integrating school-grown produce into menus (seasonal food is part of meals).
- Planning nutritional needs (students and kitchen staff work together)
- Increasing seasonal self-sufficiency (using vegetables, fruits, herbs, and legumes from the school garden).

#### **Cooperation with producers**

- “Adopt-a-Farmer” programme: the school builds long-term partnerships with specific farms that supply fresh, seasonal produce.
- Students help on farms (planting, harvesting, crop care).
- Mutual exchange: farms mentor students, while schools support the promotion of sustainable farming.
- Connection with community gardens (students contribute and learn about collective gardening).

#### **Organizing community events and knowledge exchange**

- Green Markets (students sell, exchange, or donate produce while learning basic economics and responsible consumption).
- Cooking workshops for the community (students, cooks, and local residents prepare meals together).
- Open Garden Days (the public is invited to learn about the project and sustainable practices).
- Cultural-educational events: puppet shows, songs, and stories about the importance of sustainable nutrition.

#### **Introducing a school pantry and food processing**

- Processing food for long-term use (jams, pickled vegetables, dried herbs, fruit purees).
- Linking with lessons (students learn about chemical processes in food preservation and nutritional values).
- Seasonal storage (produce remains available beyond the growing season).

#### **Connection with social kitchens and charitable projects**

- A portion of produce is donated to disadvantaged students or local charities.

- Cooperation with care homes (shared meals, cooking workshops, and recipe exchanges.)
- Support for families (organizing sustainable food packages for socially disadvantaged students)

### **INDICATORS OF SUCCESS:**

- At least **50% of garden produce** is used in school meals.
- **Regular cooperation** with at least **one local farm** (supply, knowledge exchange, workshops).
- At least one **major annual event is organized** (market, cooking workshop, open day, seed/tool exchange, etc.).
- **A school pantry** for seasonal storage and food processing is established.
- The school participates in at least **one international programme** (Eco-Schools, Erasmus+, etc.).
- **The school mentors other schools** (guiding beginners in urban gardening).

### **CLASSIFICATION KEY FOR THIS STAGE:**

**A school belongs to this stage if:**

- garden produce is regularly used in school meals;
- the school has at least one established partnership with a farm or community garden;
- kitchen staff are involved in developing sustainable menus;
- markets, open days, or cooking workshops are organized;
- the school mentors other schools in urban gardening;
- a school pantry and/or food processing system is in place.

### **IDENTIFICATION OF THE SCHOOL GARDEN STATUS:**

**At this stage, the school:**

- cultivates a diverse range of plants (vegetables, herbs, fruits, legumes);
- treats the garden as part of the school's food supply (produce regularly is served on students' plates);
- fosters community collaboration (parents, farmers, and the public are actively involved);
- integrates the school garden into the curriculum and broader environmental programmes.

**The school progresses to Stage 5 when it becomes nearly fully self-sufficient and part of the local food system.**

## ***Fifth Stage: Self-Sufficient Garden***

### **FULL SUSTAINABLE INTEGRATION: THE GARDEN BECOMES THE HEART OF THE SCHOOL'S FOOD SELF-SUFFICIENCY.**

At this stage, the garden is no longer just an outdoor classroom, but a central part of the school's food system. Most seasonal produce comes from the school garden or local farms, reducing the food carbon footprint and strengthening the local community.

The school becomes a mentor to other schools and a reference point for sustainable food practices. Students take care of food production and processing, the kitchen team designs menus based on seasonal produce, and the school follows a circular, zero-waste food model.

### **KEY ELEMENTS:**

#### **Integration of produce into school meals**

- Most school meals are based on produce from the garden or local farms.
- Seasonal meal planning (students, nutrition planners, kitchen staff, and teachers design menus together).
- Connecting kitchen staff and producers (the school kitchen collaborates closely with farms for supply and processing).

#### **Self-sufficient gardening and sustainable systems**

- Organic production methods (permaculture, biodiversity planting, ecological gardening).
- Self-sustaining systems (composting, rainwater collection, crop rotation).
- Long-term soil management (monitoring soil quality and improving fertility).

#### **School farm**

- Students encourage different animals to the garden (building habitats, creating ponds with fish and frogs).
- Students participate in maintaining the "farm" (feeding, cleaning, observing animals).
- Links to biology and science: learning about ecosystems and food chains.

#### **Long-term cooperation with farms**

- "Adopt-a-Farmer": students help with seasonal tasks on local farms.
- Seasonal production planning (students, guided by farmers, decide what to grow).

#### **Sustainable management and circular economy**

- Zero-waste approach (all food is used, leftovers go to compost).
- Circular economy (the school collaborates with local shops and caterers to reduce food waste).
- Involving parents and the community (local residents support gardening activities).

## Mentorship and knowledge sharing

- The school mentors other schools developing urban gardens.
- Educational events and networking (annual sustainability festivals, workshops for teachers and students).
- Participation in international projects (Erasmus+, Eco-Schools, etc.).

## Certification and advancement

- Obtaining sustainability certifications and joining broader networks (e.g., Green Flag, U-GROW certification).
- Integration into municipal sustainability strategies and food policies.
- Developing new sustainability solutions in cooperation with the local community and municipality.

### **INDICATORS OF SUCCESS:**

- Most **school meals** are based on **school** or **local produce**.
- **The school maintains soil fertility** through sustainable practices.
- **The school kitchen** operates on a **zero-waste** basis (or as close as possible).
- **The school is certified** as a sustainable educational institution.
- **The school regularly mentors others** (sharing knowledge and practices).
- **Annual sustainability events are organized** (food festivals, seed exchanges, etc.).
- **Active involvement** in municipal sustainability strategies.

### **CLASSIFICATION KEY FOR THIS STAGE:**

#### A school belongs to this stage if:

- it achieves the highest level of food self-sufficiency;
- produce is fully integrated into school meals and nutrition planning;
- it applies sustainable methods for preserving soil and resources;
- it mentors other schools and participates in international projects;
- it has long-term partnerships with farms and local producers;
- it is certified as a sustainable educational institution (e.g., Green Flag, etc.);
- students gain practical skills in both the garden and on farms.

### **IDENTIFICATION OF THE SCHOOL GARDEN STATUS:**

#### At this stage, the school:

- fully integrates the garden into the school food system – from seed-to-plate;
- prepares meals from its own produce and promotes a circular food system;
- supports a zero-waste school kitchen (all leftovers are recycled or composted);
- engages with the community and shares knowledge through workshops, events, and trainings;
- acts as an ambassador of sustainable development and as a role model for other educational institutions.

The school at this stage becomes a national and international role model of food self-sufficiency and ecological responsibility.

THE U-GROW PROGRAMME REACHES ITS PEAK – SCHOOLS NOT ONLY GROW FOOD, BUT ALSO EDUCATE AND CO-CREATE A SUSTAINABLE FUTURE!

## 2.4

### ***The Garden of the Future – From Seed to Community: How Does Your School Grow?***

The U-GROW programme offers schools a holistic model for developing urban gardening that combines practical education, sustainable nutrition, and strengthening of the local community.

The step-by-step system of five stages allows every school to adapt its own capacities and needs, while ensuring long-term benefits for students, teachers, and society as a whole.

#### 2.4.1

### ***What does the programme bring?***

- **Practical learning through experience:** students explore the entire process from sowing seeds to preparing meals.
- **Strengthening local food self-sufficiency:** the school becomes an important part of the sustainable food system.
- **Cooperation with farmers and community engagement:** schools and local producers co-create the future of local food resilience.
- **Development of key life skills:** responsibility, collaboration, problem-solving, and sustainable thinking.
- **Connecting schools to an international network of sustainability learning:** schools share knowledge and practices with educational institutions across other countries.



2.4.2

## ***The Garden of the Future: A Classroom, Laboratory, and Community Hub***

The garden of the future is not just a place for growing food, but also:

- **A CLASSROOM** – where students learn through practice, experimentation, and observing natural processes.
- **A LABORATORY** – for exploring ecosystems, sustainable practices, and biodiversity.
- **A COMMUNITY HUB** – connecting students, teachers, parents, farmers, and the wider local community.
- **A BRIDGE BETWEEN GENERATIONS** – passing on knowledge and traditions between young people and experienced growers.

2.4.3

## ***U-GROW – let the future grow from the soil and knowledge!***

The U-GROW programme is not just a gardening project, but a holistic sustainability system that not only educates students, but also builds a responsible society. With school gardens as foundations for food self-sufficiency and ecological awareness, we are laying the groundwork for the schools of the future – institutions that are not only educational institutions, but also centres of knowledge, collaboration, and positive change.





## CHAPTER 3

# ***Extension: Planning and Upgrading the Urban School Garden***

For the successful implementation of the U-GROW programme, the school should first assess its starting point, then set goals and a strategy for implementation, involve the local community, and ensure the training of both teachers and students.

For the optimal implementation of the U-GROW programme, it is essential that each school first evaluates its current situation, then sets goals and strategies for improvement, while also involving the local community and ensuring high-quality training for both teachers and students. This section provides concrete tools and guidelines for every stage of the process.

## Identifying the Status of the School Garden

### Assessing the current situation – How is it done?

#### Field analysis

Review available spaces, assess soil, water, and sunlight.

#### Discussions with teachers and students

What is their level of interest? Who would participate?

#### Parent and community surveys

What kind of support can be expected for gardening projects?

#### Links with the school kitchen

Is there potential to use garden produce?

#### Connections with farms and community gardens

What partnerships already exist?

### Assessment tools

- **SWOT analysis of the garden** (strengths, weaknesses, opportunities, threats).
- **Questionnaires** for teachers, students, parents, and the school kitchen.
- **Review of the school's food sources** (how much food is locally produced?).
- **Use of an app** to track plant growth and document garden activities.
- **Monitoring of crops and student involvement.**

#### Why it matters:

Before a school begins the U-GROW programme, it should determine which stage of development it is in. This allows for better planning and realistic expectations regarding implementation and resources.



**Key question: Does the school already have a garden, or is it starting from scratch?**



## Planning Progress

### Steps in Developing a School Garden

#### Setting long-term goals

What do we want to achieve in the next 1, 3, or 5 years?

#### Preparing a phased plan

How can the U-GROW programme be implemented step by step?

#### Identifying resources

Which financial, material, and human resources are needed?

#### Establishing sustainable solutions

Composting, rainwater collection, biodiversity, etc.

#### Developing partnerships

Cooperation with farms, community gardens, and the municipality.

#### Monitoring progress

Recording and evaluating success.

### Success Indicators for Planning

- **A concrete action plan** is prepared with clearly defined responsibilities.
- At least **one subject** is identified where the garden will be directly used.
- **Communication** is established **with the school kitchen staff** about the use of produce.
- **A budget and financing plan is prepared** (donations, municipal funds ...)

After identifying its status, the school prepares an **action plan** for garden development, which should be adapted to its spatial, financial, and organizational capacities.

## Community and Education

### Community involvement

#### Linking with local farms

The school cooperates with at least one local farm (for education and food production).

#### Collaboration with the school kitchen

Garden produce is integrated into school meals.

#### Event organization

Green markets, open days, cooking workshops, etc.

Community involvement and education are essential for the long-term success of the garden. The U-GROW programme is not just a gardening project, but a comprehensive learning process that includes teachers, students, parents, local growers, and the wider community.

### Visits to urban gardens

Students visit a community garden at least twice a year.

### Involving elderly citizens and local mentors in gardening activities

Community workshops for sharing knowledge about sustainable gardening.

## Educational modules for teachers and students

### Lesson plans for teachers

Practical methods for integrating gardening into lessons.

### Teacher training

Workshops on sustainable development and food self-sufficiency.

### Experimental learning

Exploring plant growth, soil analysis, data recording.

### Sustainable use of resources

Circular economy, reducing food waste, composting.

## Final success indicators

- **At least three school subjects** are included (e.g., biology, mathematics, ...).
- **Teachers complete training** for leading the gardening learning process.
- **At least one annual event** is organized with community participation.
- **Students understand** key sustainability concepts and can apply them in practice.

## 3.1

### ***U-GROW for the Future***

**PLANNING AND DEVELOPING AN URBAN SCHOOL GARDEN IS MORE THAN JUST PLANTING CROPS – IT IS A HOLISTIC PROCESS THAT COMBINES EDUCATION, SUSTAINABLE PRACTICES, AND COMMUNITY COLLABORATION.**

With a structured approach to assessment, planning, and involvement, the school not only creates a learning garden but also contributes to a sustainable lifestyle and local food self-sufficiency.

**The U-GROW programme provides a clear pathway, enabling each school to gradually develop its urban garden, increase food self-sufficiency, and become a center of sustainability education for students and the wider community.**



**CHAPTER 4**

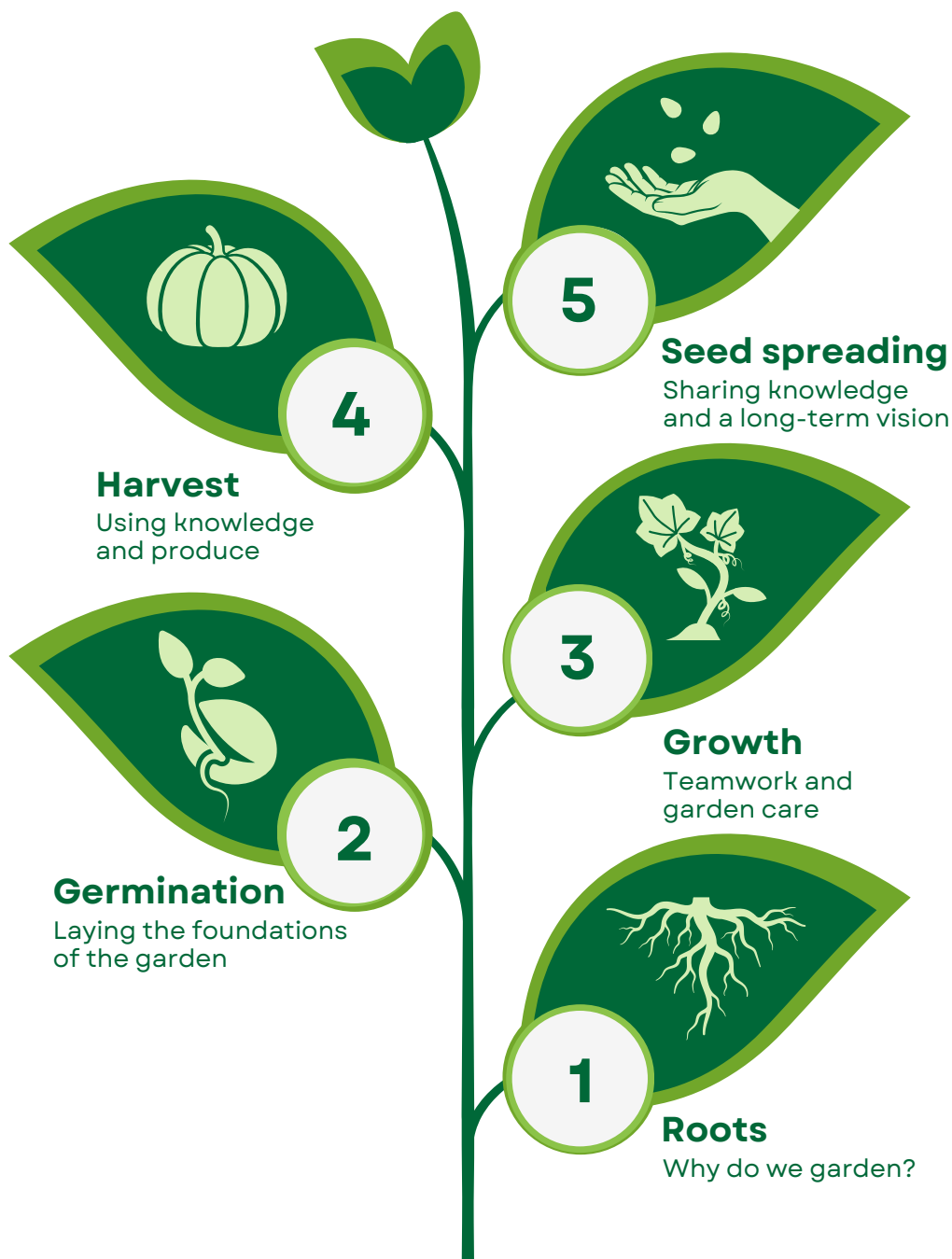
***The Five-Step  
U-GROW  
Methodology***

The methodology is based on five steps (Roots, Germination, Growth, Harvest, and Seed Spreading), through which the school gradually introduces sustainable practices into the school garden.

The methodology, built around **five key steps**, helps schools gradually introduce sustainable practices, guiding students through **experiential learning**, actively engaging the local community, and adapting to different schools, age groups, and local conditions. Each school, together with its environment, contributes to a **unique implementation of the programme**. Instead of following rigid instructions, teachers and students co-create their own path toward a more sustainable future.

Each of the five steps reflects **natural growth processes** – from Roots to Seed Spreading – symbolically showing how sustainable knowledge and practices grow together with students. The programme does not only create gardens but also fosters responsible individuals who understand the importance of self-sufficiency, biodiversity, and respect for nature.

## **5 U-GROW steps**



## 4.1

## The U-GROW Methodology Steps

1. **ROOTS:** Why do we garden?
2. **GERMINATION:** Laying the foundations of the garden
3. **GROWTH:** Teamwork and garden care
4. **HARVEST:** Using knowledge and produce
5. **SEED SPREADING:** Sharing knowledge and a long-term vision



**THE U-GROW METHODOLOGY NEVER TRULY ENDS ITS CYCLE – EVERY NEW SEED OF KNOWLEDGE LEADS TO NEW GROWTH, SHARING, AND CONNECTION.**

## 4.1.1

### Step One: ROOTS

#### UNDERSTANDING: Why do we garden?

Every garden needs strong roots – solid foundations that enable further growth and development. The first step of the U-GROW methodology focuses on exploration, discussion, and jointly defining the meaning of urban gardening within the school community. This is the planning phase, in which students, teachers, and the wider community work together to shape the vision of the garden.

#### In this process, we follow key pedagogical principles:

- **Montessori approach:** experiential learning, exploration, and hands-on activities.
- **Project-based learning:** students independently research, plan, and co-design the garden.
- **Interdisciplinary connections:** sustainability topics are integrated into science, geography, languages, art, and social studies.

## OBJECTIVES OF STEP ONE:

- Develop an understanding of the importance of sustainable nutrition, self-sufficiency, and the urban school garden.
- Motivate students to recognize the role of the garden in the local community.
- Connect the learning experience with everyday life, eating habits, and human impact on the environment.

## KEY ACTIVITIES:

### 1. Research and discussion

- **Group research** on sustainable nutrition, locally produced food, and food self-sufficiency.
- **Analysis of food pathways:** Where does our food come from? How many kilometres does it travel? What is its environmental impact?
- **Discussion:** Why are school gardens important? How can they improve food quality and nutrition?

### 2. Defining the goals of the school garden

- **Group brainstorming:** What do we want to grow? What values should the garden reflect?
- **Activity:** “Imagine Your Garden” – students draw or describe how they envision the school garden.
- **Reflection:** Who can be involved? How can the garden benefit the school and the community?

### 3. Creating a Garden Charter

- **Group agreement** on the core values of the garden (respect for nature, cooperation, responsibility).
- **Preparation of visual materials** (posters, video presentations, school exhibitions).
- **Practical activity:** students create a Garden Charter – a set of rules and agreements to follow when working in the garden (teachers can use the Gardening Etiquette as support).

### 4. Introduction to key sustainability concepts

- **Sustainability:** How do we preserve natural resources for future generations?
- **Sustainable development:** How do we balance economic, social, and environmental aspects?
- **Urban agriculture:** How can cities become more self-sufficient?
- **Locally grown food:** Why is it better for health and the environment?
- **Food self-sufficiency:** How can we reduce dependence on global markets?

### 5. First visit to a community urban garden

- Students **visit** a community urban garden
- They **explore** different ecological gardening methods.
- They **ask questions:** “What do we need for a successful garden? How do we care for the soil? How do we plan the planting?”
- **Practical activity:** planting the first plant or collecting seeds for the school garden.



## 6. Collaboration – involving parents and the local community

- **Joint meeting** of students, teachers, and parents – what do they want the garden to achieve?
- **Idea workshops:** proposals for integrating the garden into school life.
- **Exploring funding opportunities** (local projects, municipal grants, partnerships with companies, etc.).

## 7. Connection with the arts

- **Students create** stories, comics, or poems about sustainable nutrition.
- **Art challenge:** design a symbol or logo for the school garden.
- **Music approach:** compose a song about self-sufficiency and sustainability.



### SUCCESS INDICATORS FOR STEP ONE:

- Each class presents its vision of the garden.
- The school adopts an official Garden Charter.
- Students understand and can explain key sustainability concepts.
- The first visit to an urban garden is successfully completed and documented.
- A collaborative process between students, teachers, and parents is established.

**THE FIRST STEP OF THE METHODOLOGY LAYS THE FOUNDATION FOR UNDERSTANDING SUSTAINABLE NUTRITION AND URBAN GARDENING. STUDENTS ACTIVELY PARTICIPATE IN SHAPING THE VISION, REFLECT ON THE ENVIRONMENTAL IMPACT OF FOOD, AND ESTABLISH THEIR FIRST CONNECTIONS WITH PRACTICAL GARDENING.**

Step 1: ROOTS	
Plan	Setting goals, conducting research, and creating the Garden Charter.
Do	Visiting an urban garden, collaborative learning, and arts-based workshops.
Check	Evaluating understanding (questionnaires, discussions).
Act	Finalizing the Garden Charter and beginning preparations for planting.



## Step Two: GERMINATION

### LAYING THE FOUNDATIONS OF THE GARDEN: From idea to plan – How do we establish a school garden?

After defining values, goals, and the meaning of gardening in Step One, the next phase is **planning**. In this step, students and teachers design, research, and create strategies for setting up the garden.

This step also follows the Montessori approach (learning through experience), project-based learning (active student involvement), and interdisciplinary connections (integrating multiple subjects).

#### OBJECTIVES OF STEP TWO:

- Transform ideas and values into concrete plans: what the garden will look like, how it will function, and which solutions will be applied.
- Explore the best sustainable practices for the school garden (rainwater collection, composting, permaculture, etc.).
- Involve students, teachers, and the school kitchen in the planning process.

#### KEY ACTIVITIES:

##### 1. Designing a garden map

- Students and teachers **design** the layout of beds, paths, and other elements together.
- **Reflection** on sunlight, wind, access to water, and soil conditions.
- **Research**: how do different plants influence each other (companion planting, crop rotation)?
- **Practical task**: each group prepares its own proposal for the garden layout.

##### 2. Selecting plants – seasonality and ecological cultivation

- **Researching seasonality**: which plants thrive in each season?
- **Studying** local and traditional varieties.
- **Understanding ecological principles**: avoiding chemicals, using natural fertilizers, sustainable watering.
- **Activity**: students create a planting calendar – when to sow, plant, and harvest.

##### 3. Planning sustainable solutions

- **Rainwater harvesting**: how can the school use natural water resources?
- **Composting**: how can the garden reduce waste?
- **Biodiversity**: importance of pollinators – building insect hotels and installing birdhouses.
- **Circular economy**: using recycled materials to build garden structures (raised beds, greenhouses from bottles, etc.).
- **Project challenge**: students develop sustainable solutions and present them.



#### 4. Linking the garden with school meals

- **Joint meeting with school cooks:** which herbs, fruits, and vegetables can be included in school meals?
- **Preparing seasonal menus** in collaboration with the kitchen.
- **Research:** how much food is wasted? How can we reduce waste?
- **Activity:** students create proposals for sustainable school meals.

#### 5. Project work and garden prototypes

- **Garden models:** students build miniature versions of their ideas.
- **Digital presentations:** designing the garden using graphic design software.
- **Writing reports** and presenting them to the class.
- **Voting:** selecting the best elements from each design for the final garden plan.

#### SUCCESS INDICATORS FOR STEP TWO:

- Students prepare a visual garden plan (drawing, digital model, or prototype).
- Key materials and resources for establishing the garden are identified (soil, seeds, tools, water).
- At least three subjects are integrated into the planning process (e.g., biology – plants, mathematics – garden measurements, art – visual representation).
- The first connection between the garden and school meals is established.
- Students understand the importance of sustainable solutions (water, compost, biodiversity).

**STEP TWO OF THE U-GROW METHODOLOGY TRANSFORMS IDEAS INTO CONCRETE PLANS. STUDENTS LEARN TO ANALYSE SPACE, STUDY PLANT SEASONALITY, AND DESIGN SUSTAINABLE SOLUTIONS, TURNING THE GARDEN INTO AN OUTDOOR CLASSROOM WHERE THEORY MEETS PRACTICE. TEACHERS CAN ALSO USE THE URBAN SCHOOL GARDEN GUIDE AS SUPPORT IN THIS PHASE.**

Step 2: GERMINATION	
Plan	Designing the garden map, selecting plants, planning sustainable solutions.
Do	Creating models, drawings, digital designs, holding a meeting with school cooks.
Check	Analysing options, selecting the best proposals.
Act	Finalizing the garden plan, preparing for implementation (sowing and planting).



## Step Three: GROWTH

### TEAMWORK AND GARDEN CARE: How does the garden come to life?

After planning and laying the foundations, the **garden finally comes to life**. This is the “implementation” phase, where students actively garden, care for plants, and monitor their development. It is a key moment in which students test their knowledge in practice, develop responsibility and collaboration skills, and learn to observe natural processes.

This step follows Montessori principles (learning by doing), experimental learning, and interdisciplinary connections.

### OBJECTIVES OF STEP THREE:

- Teach students basic gardening skills (sowing, watering, pruning, composting).
- Develop the ability to observe and experiment: how do plants react to different conditions?
- Strengthen collaboration with local farms and the community in gardening activities.
- Give students a sense of achievement with their first harvest and help them understand the importance of local food.

### KEY ACTIVITIES:

#### 1. Basic gardening skills

- **Sowing and planting:** students learn proper seed sowing and understand the plant life cycle.
- **Watering:** recognizing that different plants need different amounts of water.
- **Pruning and plant care:** understanding how pruning can stimulate plant growth.
- **Composting:** creating a compost bin to reduce organic waste.
- **Learning about pests and natural solutions:** what to do if plants are attacked by slugs, aphids, or fungal diseases.

#### 2. Experimental learning and growth monitoring

- **Students carry out experiments:** exploring how do different factors affect plant growth (e.g., soil type, amount of water, sunlight).
- **Measurement and documentation:** recording plant height, number of leaves, flower development.
- **Comparing gardening methods:** testing whether plants grow better in soil, raised beds, or containers.
- **Keeping digital or traditional journals:** regular entries to track observations and garden progress.

#### 3. Using digital tools

- **Tracking plant growth** with photos (before and after a set period of time).
- **Using apps** to measure soil temperature, humidity, and pH levels.
- **Creating content for social media:** sharing photos and experiment results.

#### 4. Collaboration with local farms and the community

- **Visits to local farms:** students learn about food production methods and ecological farming.
- **Guest lectures:** local farmers share experiences in (organic) agriculture.
- **Exchange of seeds and experiences with other schools:** building a school garden network.
- **Organizing work days** where parents, grandparents, and volunteers help in the garden.

#### 5. First harvests and linking with school meals


- **Students harvest** their first vegetables, fruits, or herbs and use them in the school kitchen.
- **Preparing simple dishes** from garden produce (e.g., salads, herbal teas, skewers, vegetable chips, soups).
- **Organizing the first “mini-market,”** where students sell surplus produce or donate it to the local community.

#### SUCCESS INDICATORS FOR STEP THREE:

- Students participate in garden work at least once a week.
- A system for documenting plant growth is established (journals, apps, photos).
- Students independently conduct at least one experiment on environmental factors and use produce to prepare a simple meal.
- The school organizes at least one farm visit or hosts a local producer for a guest lecture.

**STEP THREE OF THE U-GROW METHODOLOGY IS WHERE THE REAL GARDENING BEGINS. STUDENTS DEVELOP PRACTICAL SKILLS, OBSERVE NATURAL PROCESSES, AND CONNECT WITH THE COMMUNITY. THROUGH COLLABORATION, EXPERIMENTATION, AND THE USE OF TECHNOLOGY, THEY GAIN A HOLISTIC UNDERSTANDING OF SUSTAINABLE AGRICULTURE.**

Step 3: GROWTH	
Plan	Task distribution, experiment planning, assigning garden care roles.
Do	Sowing, watering, pruning, conducting experiments, recording data.
Check	Analysing plant growth, reviewing experiment results, student reflections.
Act	Adjusting gardening methods, making improvements for the next season.



## Step Four: HARVEST

### USING KNOWLEDGE AND PRODUCE: From plants to plate – how does sustainable food become a reality?

After months of careful gardening, the most anticipated moment arrives – the harvest! This step represents the “Check” phase in the Deming PDCA cycle, where students use their knowledge and produce in school meals, cooking workshops, and community events.

The focus of Step Four is on sustainable food consumption, reducing waste, and the circular economy, giving students insight into the connection between food production, nutrition, and social responsibility.

#### OBJECTIVES OF STEP FOUR:

- Teach students how to use produce in everyday life.
- Link gardening with sustainable nutrition and food waste reduction.
- Strengthen cooperation between the school, community, and charitable organizations.
- Develop students’ entrepreneurial skills through selling or exchanging produce.

#### KEY ACTIVITIES:

##### 1. Cooking workshops “From Garden to Plate”

- **Students**, together with the school kitchen cooks or guest chefs, prepare simple meals using their own produce.
- **Exploring traditional local recipes** and adapting them for sustainability.
- **Activity:** students prepare a seasonal menu from school produce and organize a tasting for teachers and parents.
- **Focus on healthy eating**, local food, and reducing food waste.

##### 2. Organizing a “Green Market”

- **Students set up a stand** at the school or at a local market to sell or exchange produce, herbs, seeds, and seedlings.
- **Developing entrepreneurial skills:** how to set prices, attract customers, and communicate with buyers.
- **Calculating production costs:** how much does it cost to grow certain vegetables and fruit, and how does this relate to sustainable development?
- **Building connections** with local farmers and markets.

##### 3. Circular economy and food waste reduction

- **Tracking the amount of food waste** at school: how much is thrown away and how can it be reduced?
- **Using leftover produce** in new dishes (e.g., vegetable chips from peels, herb cubes for soups).
- **Demonstrating the circular economy:** from composting to reuse.
- **Experimental learning:** students compare how different storage methods affect food freshness.



#### 4. Connecting with the local community and charities

- **Part of the produce** is donated to local charities or soup kitchens.
- **Students prepare educational posters and videos** about the importance of food accessibility for all.

#### SUCCESS INDICATORS FOR STEP FOUR

- A portion of the produce is used in school meals.
- Students can prepare at least one simple dish from school produce.
- At least one cooking workshop is organized with a focus on local and sustainable food.
- At least one community event on sustainable nutrition is carried out.

**STEP FOUR OF THE U-GROW METHODOLOGY TEACHES STUDENTS HOW TO USE THEIR OWN PRODUCE IN A SUSTAINABLE WAY. THROUGH COOKING WORKSHOPS, MARKETS, AND CHARITABLE PROJECTS, THEY DEVELOP ENTREPRENEURIAL, SOCIAL, AND ENVIRONMENTAL SKILLS THAT WILL SERVE THEM IN THE FUTURE.**

**TEACHERS CAN ALSO RELY ON THE URBAN SCHOOL GARDEN GUIDE FOR SUPPORT IN THIS STEP.**

<b>Step 4: HARVEST</b>	
<b>Plan</b>	Plan cooking activities, allocate produce, organize events.
<b>Do</b>	Prepare meals, run a market, reduce food waste.
<b>Check</b>	Evaluate the use of produce, analyze waste reduction.
<b>Act</b>	Improve for the next season, increase community involvement.



## Step Five: SEED SHARING

### EXPANDING KNOWLEDGE AND A LONG-TERM VISION: How does knowledge of sustainability become a legacy?

The final step of the U-GROW methodology represents the Act phase of the PDCA cycle, where students pass on their knowledge, reflect on their experiences, and contribute to spreading sustainable practices.

Just as seeds don't stay in one place but spread further, in urban gardening it is essential that students, teachers, and schools become mentors to others. Schools that successfully complete the programme take on a leading role in the community, connect with other schools, and contribute to long-term sustainable change.

#### OBJECTIVES OF STEP FIVE:

- Reflect on and document successful practices and learning experiences.
- Connect with schools that are just starting the programme and share knowledge.
- Establish a long-term mentoring system and join a wider network of sustainable schools.
- Obtain the U-GROW Certificate.

#### KEY ACTIVITIES:

##### 1. Documenting successes and challenges

- **Students prepare final reports and presentations:** What did we learn? What could be improved?
- **Creating digital journals** and photo documentation of the gardening journey.
- **Recording short videos** to share experiences and insights.
- **Publishing educational resources**, plans, recipes, and reflections on the school's or/and Eco-Schools' online platforms.

##### 2. Connecting with other schools and networking

- **Organising exchanges** with other schools: students and teachers act as mentors to support new gardens.
- **Taking part in national and international projects** (e.g. Eco-Schools, Erasmus+), sharing experiences in sustainable gardening.
- **Establishing a local U-GROW network** of sustainable schools to exchange advice and knowledge.
- **Students lead workshops for younger peers**, teaching the basics of gardening and sustainable food practices.

##### 3. Preparing learning plans and guides for future generations

- **Co-creating and sharing teaching materials** to integrate school gardening into lessons (guides, worksheets, interactive games).
- **Developing a long-term action plan** to ensure programme sustainability in future school years.
- **Setting up peer mentoring**, where each new generation of students inherits responsibility for the garden and passes knowledge forward.

#### 4. Obtaining the U-GROW Sustainable School Certificate

- Schools that complete all five steps and demonstrate sustainable practices receive the **certificate**.
- The certificate confirms the **school as a reference point** for sustainable gardening and food self-sufficiency.
- **Schools can take the next step** by joining international sustainability networks.

#### SUCCESS INDICATORS FOR STEP FIVE:

- Final student reflections and presentations are prepared.
- Learning plans and guides are available for continued use.
- The school receives the U-GROW Sustainable School Certificate.

**THE FIFTH STEP OF THE U-GROW METHODOLOGY ENSURES THAT THE PROGRAMME DOESN'T REMAIN WITHIN A SINGLE GENERATION, BUT CONTINUES TO GROW AND SPREAD OVER TIME. THROUGH MENTORING, KNOWLEDGE EXCHANGE, AND CERTIFICATION, SCHOOLS TAKE ON AN ACTIVE ROLE IN SHAPING A SUSTAINABLE FOOD FUTURE.**

Step 5: SEED SHARING	
Plan	Document knowledge, organize exchanges, and a design programme sustainability plan.
Do	Share knowledge, mentor other schools, build a network.
Check	Evaluate the programme's long-term impact on the school and community.
Act	Develop a long-term strategy and expand the programme to new schools.



A vibrant garden bed with various leafy greens and herbs growing in wooden planters. The plants are lush and green, with some showing reddish-purple stems. The garden is set in a wooden frame, and the soil is dark and rich. The overall scene is bright and healthy, suggesting a well-maintained urban garden.

## CHAPTER 5

# *Educational Programme*

Through the educational programme, students gain practical knowledge of gardening, urban agriculture, and local food, while also learning how to reduce food waste and developing social, communication, and entrepreneurial skills.

## 5.1

### ***The Garden of Knowledge: When Growth Becomes Legacy***

**The U-GROW methodology and educational programme** offer a comprehensive and sustainability-oriented approach to urban gardening, food self-sufficiency, and environmental education. Through the five key steps – Roots, Germination, Growth, Harvest, and Seed Sharing – students gradually develop an understanding of sustainable processes, acquire practical skills, and strengthen connections with their community.

The educational programme serves not only as a teaching tool but also as a platform for **holistic learning** that combines interdisciplinary approaches, **experiential learning**, and **project-based work**. Students gain concrete knowledge of gardening, sustainable agriculture, local food, and food-waste reduction, while also developing social, communication, and entrepreneurial skills.

Through this process of learning and experience, it is not only the garden that grows, but also young people's awareness of sustainability, cooperation, and responsible use of resources. With this approach, **schools establish gardens and become key drivers of sustainable development** and long-term shifts towards local food self-sufficiency and responsible consumption.

Schools that successfully complete all five steps gain valuable experience and practical knowledge, and can become mentors to other schools and the wider community. In this way, the U-GROW programme is not just a one-time project but evolves into a sustainable movement that continues to expand and grow – like nature itself.

We are aware that sustainability education is not only about transferring knowledge but also about shaping values, fostering responsible behaviour, and strengthening our connection with the natural world. We believe that students must be included from the earliest years in activities that teach respect for nature, responsible use of resources, and an understanding of the importance of community.

**Together with you, dear teachers, we are building a future in which young people will actively co-create a fairer society and contribute to the well-being of all living beings on our planet. We invite you to join the implementation of the U-GROW programme and help us pave the way toward a more sustainable future.**



## 5.2

# ***Structure of the Educational Programme: Content and Learning Phases***

### URBAN AGRICULTURE, SUSTAINABLE DEVELOPMENT, FOOD SELF-SUFFICIENCY

- **A short introduction to key concepts:** sustainability, urban agriculture, locally grown food, and food self-sufficiency.
- **Emphasis on the importance of seasonal, locally produced food** and critical reflection on food supply chains.
- This introduction serves as the **theoretical foundation** for understanding the broader context in which the school garden is situated.

### THE URBAN SCHOOL GARDEN – AN OUTDOOR CLASSROOM

At the heart of the programme lies the urban school garden as a practical tool for experiential and sustainable learning.

**The programme includes supportive tools:**

- **Urban School Garden** – pedagogical guidelines and examples of good practice.
- **Gardening Journal** – a learning tool for recording observations, experiments, and student tasks.
- **Gardening Etiquette** – ten rules of behaviour and attitudes toward nature and the community.

### CORE MODULES OF THE PROGRAMME:

- **Module 1: Food Self-Sufficiency**
- **Module 2: Environment and Biodiversity**
- **Module 3: Waste Reduction and Circular Economy**
- **Module 4: Developing Social Skills**
- **Module 5: Sustainable Mobility**
- **Module 6: Energy**

**The modular design allows the content to be adapted to different age groups and subjects. Each module includes guidelines, objectives, activities, suggestions for further development, and teaching materials.**

## 5.3

### ***Educational Programme Activities***

The programme offers a wide range of activities that help students gain a deeper understanding of sustainability concepts through practical experience. The activities are adapted to different age groups and include both theoretical and practical aspects of learning, with a strong emphasis on experiential learning and connection to the local environment.

#### 5.3.1

### ***Theoretical Introduction: Understanding Key Sustainability Concepts***

Every sustainable practice begins with **understanding the basics**. The theoretical part of the programme supports teachers in introducing key concepts such as **sustainability, urban agriculture, locally produced food, and food self-sufficiency**. These topics accompany each module and form the foundation for reflection and practical work. With this knowledge, students can more easily recognise the importance of sustainable actions and apply them in their everyday lives.

#### 5.3.2

### ***Practical Activities: Sustainability in the Classroom and the Garden***

The best way to learn is through practice! The programme includes a variety of hands-on activities that allow students to experience sustainability directly:

- **Gardening in the school's urban garden** – students learn to grow and care for plants, compost, and observe natural processes.
- **Learning about food self-sufficiency** – students prepare meals from garden produce and explore the benefits of local food systems.
- **Engaging parents and the local community** – through different activities and events, students involve families and community members in the programme.
- **Experiments and observations** – students explore soil, water, plant growth, and environmental factors through hands-on experiments.

These activities encourage creativity, scientific curiosity, and social skills, while helping students develop a holistic understanding of sustainable practices.

5.3.3

### ***Visits to Local Farms and Markets: Getting to Know Local Producers***



Direct contact with local food producers is an essential part of the programme. Visits to local farms and markets allow students to:

- discover how food is produced and learn about the real challenges of farming,
- compare urban and rural agriculture,
- connect with their local environment and understand the importance of short supply chains,
- develop an appreciation for the work, knowledge, and sustainable practices of farmers.

**Such visits are not only educational but also motivational, showing students real opportunities for sustainable action within their communities.**

5.3.4

### ***Hands-On Learning at an Experiential Gardening Site***

The programme also includes visits to an urban learning garden – a dedicated experiential space where students can explore diverse gardening approaches that may not be possible in their own school gardens. At these larger urban gardens, students learn about self-sufficient growing methods in city environments, test alternative sustainable solutions, and gain practical experience they can later apply to their school gardens.

**ACTIVITIES AT THE GARDENING SITE PROVIDE A HOLISTIC LEARNING EXPERIENCE THAT BRIDGES THEORY AND PRACTICE, ENCOURAGING STUDENTS TO ACTIVELY SEEK SOLUTIONS FOR A SUSTAINABLE FUTURE. THROUGH EXPERIENTIAL LEARNING, YOUNG PEOPLE BECOME AWARE OF HOW THEIR CHOICES AND ACTIONS AFFECT THEIR ENVIRONMENT AND COMMUNITY.**



**CHAPTER 6**

***Theoretical  
Introduction:  
Understanding the  
Foundations of  
Sustainability***

This chapter provides clear explanations of the key concepts in the educational programme – sustainability, sustainable development, urban agriculture, locally produced food, and food self-sufficiency – along with a variety of learning materials that help students internalise and apply their new knowledge.

**THE CONCEPTS OF SUSTAINABILITY, SUSTAINABLE DEVELOPMENT, URBAN AGRICULTURE, LOCALLY PRODUCED FOOD, AND FOOD SELF-SUFFICIENCY FORM THE COMMON THREAD RUNNING THROUGH THE ENTIRE U-GROW EDUCATIONAL PROGRAMME – FROM ITS METHODOLOGY AND MODULES TO THE ACCOMPANYING MATERIALS AND THE GUIDE *URBAN SCHOOL GARDEN*.**

To help students truly internalise these key ideas through practical activities and learning materials, this theoretical introduction provides clear explanations of the main sustainability concepts, adaptations for different educational stages, and ready-to-use activity suggestions and materials for classroom use or programme extension activities. It serves as a foundation for further work and as a tool for integrating sustainability topics into various school subjects – from geography and science to home economics and art.

To ensure that students understand and recognise these concepts in everyday life, we recommend introducing them across diverse learning contexts – for example, during discussions about food in home economics, while visiting a local market, or while planting herbs in the school garden. Each concept is accompanied by suggested activities and learning resources that can be used as provided or adapted according to the subject taught, the age group of students, the season, or the school's available time and space.

The definitions are based on the Education for Sustainable Development (ESD) framework, the European GreenComp framework (competences for sustainability), the document Common Goals and Their Integration into Curricula and Learning Standards, materials developed within the CoFarm4Cities project, and the experience and best practices of the Eco-Schools programme.

## 6.1

### ***Objectives of the Theoretical Introduction***

- **Students understand the concept of sustainability** and can identify sustainable and unsustainable actions in everyday life.
- **Students learn the basic characteristics of urban agriculture** and understand how cities can become more self-sufficient.
- **Students recognise the importance of locally produced food** and can distinguish between local and imported products.
- **Students understand the concept of food self-sufficiency** and can explain why it is important for individuals, communities, and the country as a whole.



## 6.2

## Sustainability

### GENERAL DEFINITION (GreenComp):

Sustainability means prioritising the needs of all living beings and the planet by ensuring that human activity does not exceed the Earth's limited ecological capacity.

### BY AGE GROUPS:

#### 1. Ages 6–8:



Sustainability means taking care of nature so that people, animals, and plants can live well in the future too. This includes not wasting food, turning off the lights when we don't need them, and walking instead of driving whenever possible.

#### 2. Ages 9–11:



Sustainability means using natural resources such as water, food, and energy wisely so they remain available for future generations. It means eating locally grown food, sorting waste, saving electricity, and caring for plants and animals – because we all share the same planet.

#### 3. Ages 12–14:



Sustainability is a way of living that allows people to meet their needs without harming the environment or society, while ensuring that future generations can do the same. It means not consuming more resources than the planet can regenerate. Sustainability is based on three pillars: environmental (ecological balance), social (justice and equality), and economic (long-term economic viability and responsible consumption). It involves making responsible choices about how we use resources, what we eat, how we consume, and how we care for our communities.



6.2.1

## ***Sustainable Development***

### **GENERAL DEFINITION:**

Sustainable development means growth and progress that meet the needs of the present generation without compromising the ability of future generations to meet their own needs. It means caring for the environment, society, and the economy at the same time, while seeking a balance between development and the preservation of resources.

### **KEYWORDS:**

Environmental studies, science and technology, languages (native language and English), geography, biology, visual materials, flashcards, quizzes, advertising texts, essays, group work, ages 6–8, ages 9–11, ages 12–14.

### **LEARNING MATERIALS:**

#### ***Material 1: Sustainable or Not?***

Students aged 6–8 sort illustrated cards showing environmentally friendly and harmful actions. Students aged 9–11 and those aged 12–14 discuss the situations on the cards and connect them to examples of sustainable and unsustainable behaviour.

#### ***Material 2: Sustainability Quiz***

Students answer questions about sustainable behaviour. The quiz can be completed individually or in groups, and teachers can also organize in-class or inter-class competitions.

#### ***Material 3: Advertising Text***

Students create a short advertising text promoting sustainability and sustainable development.

#### ***Material 4: Writing in a Foreign Language***

Students write a short text in English titled Our (Un)Sustainable City in the Future. They can choose from three approaches:

- describe a sustainable city;
- describe an unsustainable city;
- compare the two cities, highlighting key differences and consequences.



## 6.3

## Urban Farming

### GENERAL DEFINITION (Project CoFarm4Cities):

Urban farming is an activity carried out by individuals or communities, with the main purpose of improving local food self-sufficiency in urban environments.

#### BY AGE GROUPS:

##### 1. Ages 6–8:



Urban farming means growing plants and producing food in cities. Examples include small city gardens, raised beds in courtyards, vegetables in pots on balconies, or even small farms in urban areas.

##### 2. Ages 9–11:



Urban farming is the production of food in cities, sometimes including animal husbandry. It can take the form of community gardens, raised beds, rooftop gardens, or balcony vegetable gardens.

##### 3. Ages 12–14:



Urban farming refers to activities focused on food production in cities. It includes innovative approaches such as rooftop gardens, hydroponics, community gardens, and vertical farming. Beyond providing local food, urban farming also brings broader social and environmental benefits – strengthening local communities, reducing the carbon footprint, and creating green spaces in urban environments.

#### KEYWORDS:

Environmental studies, science and technology, biology, geography, art, worksheets, research assignments, collaboration, painting, drawing, creative projects, urban farm visits, types of farms, critical thinking, ages 6–8, ages 9–11, ages 12–14.

#### LEARNING MATERIALS:

##### **Material 1: Visit to a Local Urban Farm** (Worksheet)

Students visit an urban farm, observe and record their observations, and complete a worksheet documenting what they have learned.

### **Material 2: Challenges and Solutions in Urban Farming**

Students explore the key challenges of urban farming – such as limited access to land in cities, lack of agricultural knowledge, and limited space – and propose possible solutions. Examples include: using abandoned or degraded urban areas, providing education and workshops, creating multifunctional green spaces, integrating gardens with recreational areas, developing vertical farms, and composting.

### **Material 3: Types of Urban Farms**

Students match different types of urban farms with their descriptions and corresponding images.

### **Material 4: Debunking Myths about Urban Farming**

Students critically examine common myths related to urban farming. They discuss, evaluate, and decide whether the statements are true or false, then create and explain some of their own urban farming myths.

### **Material 5: My Urban Farm**

Students draw or design their own vision of an urban farm. The teacher encourages them to think about how their farm would contribute to sustainable living in the city.



## 6.4

## Locally Produced Food

### GENERAL DEFINITION (Ministry of Agriculture, Forestry and Food of Slovenia):

Locally produced food is food that is grown, processed, and consumed close to the consumer – usually within the same region or country. It emphasises short food supply chains, which means less transport, greater freshness, and higher nutritional value. It also contributes to sustainable development by reducing the carbon footprint, supporting local farmers, and promoting food security within the community.

#### BY AGE GROUPS:

##### 1. Ages 6–8:



Locally produced food is food that grows or is made near where we live. This means that apples, milk and meat come from nearby farms, not from another country. Such food is fresher, healthier, and helps local farmers earn a living.

##### 2. Ages 9–11:



Locally produced food is food that comes from places close to our home rather than from far away. Because it doesn't travel long distances, it stays fresher and more nutritious, doesn't need as many preservatives, and pollutes the environment less. By buying local food, we also support farmers in our community, helping them earn a fair income.

##### 3. Ages 12–14:



Locally produced food is food that is grown, processed, and consumed within the same geographical area where we live. Short food supply chains reduce the environmental impact of transport, improve food security, and support sustainable development. Local food is usually tastier, fresher, and richer in vitamins and minerals than imported food.



**KEYWORDS:**

Environmental studies, science and technology, biology, home economics, artificial intelligence, leaflet, poster, transport, food labelling, critical thinking, research, homework, parents, group work, pair work, ages 6–8, ages 9–11, ages 12–14.

**LEARNING MATERIALS:****Material 1: Artificial Intelligence**

Students observe images generated using an AI tool such as ChatGPT. Under each image, they describe what they see and explain whether they think the scene could exist in real life – and why or why not. Afterwards, they compare answers with classmates.

As homework, students imagine something impossible related to food production and write a prompt for the AI tool to generate an image. They then present the image to their classmates and discuss the result.

**Material 2: The Advantages of Locally Produced Food**

Students design a leaflet, poster, or infographic aimed at their peers and parents, presenting the main benefits of locally produced food.

**Material 3: Where Does Our Food Come From?**

Students bring one packaged food item from home in its original packaging. Teachers show them where to find the product label and how to identify the country of origin. Each student reads the label and estimates how far their food has travelled to reach the country where they live.

**Material 4: The Long Journey to Our Plate**

Students imagine how a selected fruit or vegetable travels from its country of origin to their own. They use the country's capital city as a starting point, then add an estimated 100 km for local distribution to reach their town/area. They describe the modes of transport used and estimate the total distance covered.

It is important that students learn to recognise what AI tools can and cannot do. These systems are based on advanced machine learning models that learn from vast amounts of text and data – which may include inaccurate information. Artificial intelligence is not all-knowing; it learns from patterns rather than personal experience.

**TEACHERS SHOULD EXPLAIN THAT AI-GENERATED IMAGES ARE THE RESULT OF PROBABILITY-BASED MODELLING, REAL-LIFE EXPERIENCE.**



## 6.5

## Food Self-Sufficiency

### GENERAL DEFINITION (Ministry of Agriculture, Forestry and Food of Slovenia):

Food self-sufficiency is the ratio between domestic food production and domestic food consumption. A 100% self-sufficiency rate means that a country can meet all of its food needs through its own production.

#### BY AGE GROUPS:

##### 1. Ages 6–8:



Food self-sufficiency means that we can produce enough food in our country – in gardens, fields, or on farms – so we don't need to buy it from other countries.

##### 2. Ages 9–11:



Food self-sufficiency means that a country produces enough food for its population. A 100% self-sufficiency rate means that all the food people eat can be grown locally without importing it from other countries.

##### 3. Ages 12–14:



Food self-sufficiency shows how much food is produced within a country compared to how much is consumed. A 100% self-sufficiency rate means that domestic production fully meets the food needs of the population so imports are not necessary.

#### KEYWORDS:

Environmental studies, science and technology, geography, art, classification, pictures, drawing, online, research, reflection, COVID-19, pair work, group work, creativity, imports, ages 6–8, ages 9–11, ages 12–14.



## LEARNING MATERIALS:

### **Material 1: Homegrown or Imported?**

Students sort images of different foods into two categories – domestic and imported. They discuss why some foods are more often produced locally while others are mostly imported.

### **Material 2: Local Basket**

Students draw or paint a National Food Basket, including fruits, vegetables, and other foods that are grown or produced in their own country. They reflect on traditional dishes and their role in shaping cultural identity.

### **Material 3: Are We Self-Sufficient?**

Students use online sources (e.g. national statistics offices, ministries of agriculture) to find data on domestic food production. They list at least five foods that the country produces enough of and five that are mostly imported.

### **Material 4: The Importance of Food Self-Sufficiency**

Students discuss why it is important for a country and its people to produce as much of its food as possible locally.





**CHAPTER 7**

***Sources and  
References***

During the development of the U-GROW educational programme and methodology, we drew on the expertise of a range of experts in sustainability, environmental education, and pedagogical innovation.

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A photograph of two young children in a garden. In the foreground, a young boy with blonde hair, wearing a green polo shirt, is focused on placing a carrot into a wooden basket. The basket is filled with fresh produce, including several bright red radishes with their green leaves, a large red tomato, and some green leafy vegetables. In the background, a girl with brown hair in a braid, wearing a blue shirt, is looking down at the basket. The garden setting is visible with soil and some green plants. A white circular graphic is overlaid on the image, containing text.

## CHAPTER 8

# *Appendices*

The appendices include a variety of materials that can be used both in the classroom and during school activities – in the school garden, on activity days, or as part of extracurricular programmes.

# Sustainable or Not?

## ACTIVITY IDEAS:

- Each student receives a card. They decide whether it represents a sustainable or unsustainable action and explain their reasoning. What are the consequences of this action for people and the environment?
- Working in groups, students sort the images into two categories: Sustainable and Unsustainable. They justify their choices.
- Students suggest a more sustainable alternative for each unsustainable action.



# Sustainable or Not?



Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Sustainability Quiz



**Circle the letter next to the correct answer.**

**1. Which of these actions is sustainable?**

- A) Using a reusable water bottle instead of single-use plastic.
- B) Driving a car for short distances instead of walking or cycling.
- C) Buying fast-fashion clothes because they're cheap and easily available.

**2. Which fruit represents the most sustainable choice?**

- A) Mango from Brazil.
- B) Apple from a local farmer.
- C) Organic mandarins from Bosnia.

**3. How can we reduce packaging waste?**

- A) Buy products without unnecessary plastic packaging.
- B) Put plastic bags into the recycling bin after use.
- C) Always take plastic bags from the store because they can be reused as trash bags.

**4. How can we save water?**

- A) Leave the tap running while brushing your teeth.
- B) Use rainwater for watering plants in the garden.
- C) Take long baths instead of quick showers.

**5. Which way of washing clothes is the most sustainable?**

- A) Wash clothes even if they aren't dirty, because it takes more energy to remove stains later.
- B) Fill the washing machine to full capacity, use an eco programme and eco detergents.
- C) Sort clothes by colour before washing to save energy.

**6. What happens to plastic that isn't disposed of or recycled properly?**

- A) It completely decomposes in a few years.
- B) It may end up in illegal dumps, rivers, or oceans and pollute the environment for hundreds of years.
- C) It's collected by waste collection workers.

**7. Which food storage method is the most sustainable?**

- A) Use single-use plastic bags and cling film.
- B) Buy food in plastic packaging so it stays fresh longer.
- C) Store food in glass containers or reusable boxes.

**8. Which option represents the most sustainable choice for home lighting?**

- A) Use LED bulbs and switch off lights when not needed.
- B) Use the cheapest bulbs since they always consume the least energy.
- C) Keep lights on all the time so energy use is balanced.

**9. Which mode of transport is the most sustainable?**

- A) An airplane, because it's the fastest way to travel.
- B) A bus, because many people travel together.
- C) A private car, because you can drive exactly where you want.

**10. How can we most effectively reduce air pollution?**

- A) Walk or cycle for short distances instead of driving.
- B) Use as many electric devices as possible, since they produce little pollution.
- C) Pick up litter and throw it in the bin when you see it on the ground.

**Check your answers:**

- 10. A
- 9. B
- 8. A
- 7. C
- 6. B
- 5. B
- 4. B
- 3. A
- 2. B
- 1. A

# Advertisement Text

## Homework:

Carefully observe the advertisements you come across on your smart devices. Can you find any that promote sustainability? What are they advertising? Why do you think there aren't more ads like these?

## Instructions:

Create an advertisement that promotes sustainability and sustainable development.

Pay attention to the characteristics of this type of text, use correct grammar, and create meaningful content.

You can use the following prompts to help you:

- What would a city look like in the future if it followed sustainable principles – and what if it didn't?
- How can we save water or electricity?
- How can we reduce food waste?

# Writing in a Foreign Language

Our (Un)Sustainable City of the Future

## Instructions:

Imagine a city in the future. You have three options for your writing:

- **1. A Sustainable City** – Describe a city where people live sustainably. How do they take care of the environment? What kind of transport, energy sources, food production, and waste management do they use? How do these practices improve the quality of life?
- **2. An Unsustainable City** – Describe a city where people have ignored sustainability. What problems have appeared? How does pollution, overconsumption, or lack of green spaces affect everyday life? What challenges do the citizens face?
- **3. Both Scenarios** – Describe and compare both cities. What are the key differences between a sustainable and an unsustainable city? How do human actions shape the future?

## Tips:

- Use adjectives to describe the city (green, polluted, clean, crowded, peaceful...).
- Think about the environment, energy, food, water, and transport.
- End your text with a short reflection: How can we make our city more sustainable today?

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Visit to a Local Urban Farm

Answer the following questions about today's visit to the urban farm.



1 Is this your first time visiting an urban farm?

\_\_\_\_\_

2 What is the name of the farm you visited? Where is it located?

\_\_\_\_\_

\_\_\_\_\_

3 What do they grow or produce on the farm? List at least three products.

\_\_\_\_\_

4 Where and to whom do they sell their products?

\_\_\_\_\_

5 Do they keep any animals on the farm? Which ones? How many?

\_\_\_\_\_

\_\_\_\_\_

6 Why is this farm important for the city?

\_\_\_\_\_

\_\_\_\_\_

7 Who works on the farm?

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8 What challenges do urban farmers face?

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9 How do the farmers imagine their farm in 5, 10, or 20 years?

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10 What is the farm's relationship with the local community?

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11 How is this farm different from a traditional "rural" farm?

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12 Name three things from the visit that you will remember most.

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13 In your own words, explain what an urban farm is. Then list three reasons why urban farms are important for cities.

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# Challenges and Solutions in Urban Farming

Think about the additional challenges urban farmers face.

Write down at least three more challenges and suggest at least two possible solutions for each one.

## Instructions:

On the left side of the table, you'll find several common challenges of urban farming. For each challenge, propose at least two realistic solutions. If you think the solution could work in your city, mark it with a ✓.

<i><b>CHALLENGE</b></i>	<i><b>POSSIBLE SOLUTIONS</b></i>
<b>LIMITED ACCESS TO LAND IN CITIES</b>	
<b>LACK OF AGRICULTURAL KNOWLEDGE</b>	
<b>LACK OF SPACE</b>	
<b>INCREASING DEMAND FOR LOCAL FOOD</b>	

# Challenges and Solutions in Urban Farming

Think about the additional challenges urban farmers face. Write down at least three more challenges and suggest at least two possible solutions for each one.

<i>CHALLENGE</i>	<i>POSSIBLE SOLUTIONS</i>
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## CLIMATE CHANGE

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## WATER DEMAND

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# TYPES OF URBAN FARMS

Match each type of urban farm with its correct description and image.



**COMMUNITY  
GARDENS**

Also known as a green roof. It improves a building's insulation and helps reduce heat.



**SCHOOL  
GARDEN**

Areas with individual plots rented by residents for personal food production.



**ROOFTOP  
GARDEN**

Plants are grown vertically in multiple layers inside buildings or in controlled environments.



**VERTICAL  
FARM**

A garden located on school grounds, used for hands-on learning.



### **HYDROPONIC FARM**

Growing plants on balconies or terraces in containers or pots.



### **AQUAPONIC FARM**

A city-based farm that combines plant cultivation and animal husbandry.



### **BALCONY GARDEN**

Plants are grown in water enriched with nutrients – without using soil.



### **(URBAN) FARM**

A farm where plants are grown with the help of fish; fish waste provides nutrients for the plants.



### **URBAN ORCHARD**

A public urban space with fruit trees open for community use.

# Debunking Myths about Urban Farming

Use credible literature and reliable sources to support your answers.

## Instructions:

Read the myths about urban farming below. For each myth, decide whether it is true or false. Explain your reasoning using scientific sources, examples, or personal experience. If you decide the statement is false, write down the correct version of the statement.

**MYTH**

**EXPLANATION**

**URBAN-GROWN FOOD IS POLLUTED.**

**VEGETABLES GROWN ON LOCAL URBAN FARMS ARE MORE EXPENSIVE THAN THOSE BOUGHT IN SUPERMARKETS.**

**“FOOD IS FOOD”:  
IMPORTED FOOD HAS THE SAME TASTE, NUTRITIONAL VALUE, AND VITAMIN CONTENT AS LOCALLY PRODUCED FOOD.**

# Debunking Myths about Urban Farming

Use credible literature and reliable sources to support your answers.

## Instructions:

Add at least two urban farming myths of your own and reflect on them.

*MYTH*

*EXPLANATION*

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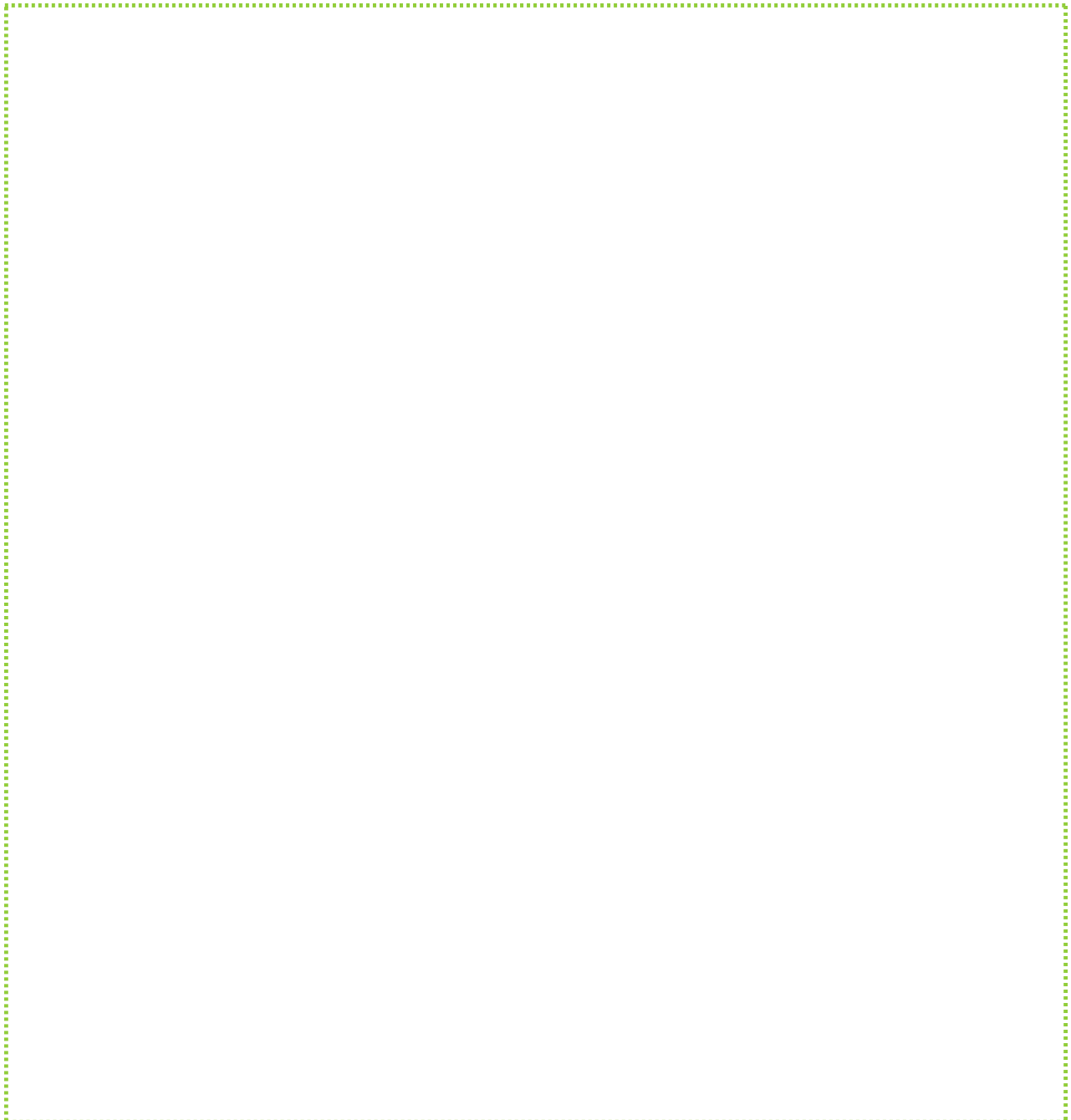
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# MY URBAN FARM

ADD DIFFERENT  
VEGETABLES, FRUITS,  
ANIMALS AND PEOPLE  
TO YOUR PICTURE.

## INSTRUCTIONS:

DRAW YOUR DREAM URBAN FARM. THINK ABOUT WHAT GROWS AND LIVES THERE. INCLUDE PLANTS, ANIMALS AND PEOPLE IN YOUR DRAWING. DON'T FORGET TO ADD AREAS WHERE CITY RESIDENTS CAN REST, PLAY, OR LEARN. WHEN YOU FINISH, GIVE YOUR FARM A NAME.



NAME OF MY FARM: \_\_\_\_\_

# Artificial Intelligence

**Homework:**  
Think of something impossible related to food production. Give an AI tool a prompt to create an image based on your idea. Show your image to your classmates at school and compare your images.

## Instructions:

The pictures below were generated using the artificial intelligence tool ChatGPT. Observe them carefully. Under each picture, write what it shows and explain why you think what's happening in it is (im)possible. Compare your answers with a classmate. Do you share the same opinion?

**In the picture, there is:**

---

---

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**In the picture, there is:**

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**In the picture, there is:**

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# The Advantages of Locally Grown Food

Imagine your work will be read by someone who knows nothing about locally grown food. Present the topic briefly and in an engaging way.

## Instructions:

- Create a poster, infographic, or leaflet that is both educational and engaging for your classmates and parents.
- Present the advantages of locally grown food (for example: fresher and tastier food, less packaging, support for local farmers).
- Add pictures or drawings (you can draw them yourself or find them in approved sources).
- Write short, clear text that is easy to read and understand.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Where Does the Food We Eat Come From?



Answer the following questions about the food item you brought to school today.

1 My food item is:

---

2 Country of origin (check the label):

---

---

3 How do you think it travelled to our country?

---

4 How long do you think it took to reach our country?

---

---

5 Could this food be produced locally? Why or why not?

---

---

6 What do you think would be different if this food were produced locally?

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# The Long Journey to Your Plate

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Date: \_\_\_\_\_

## Instructions:

1. Choose an imported fruit or vegetable and identify its country of origin.
2. Start your route at the capital city of that country, adding 100 km (transport from the farm to the capital by truck).
3. Airport/Port: Search online for real flight or shipping routes from that capital city to Europe (including possible stopovers).
4. Record every stop and change of transport (a stop is any airport, port, train, or bus station; a change means switching from one means of transport to another).
5. From the European hub, continue your journey to your country using only public transport (look up schedules online). If there's no direct route, combine options.
6. Finally, add another 100 km – the trip from the final station to a warehouse, a store, and your home.
7. For each leg, write down the transport method and approximate distance. Add up all kilometres (including both +100 km segments) and note the total number of stops or transfers.

**1. SELECTED FOOD ITEM:** \_\_\_\_\_

**2. COUNTRY OF ORIGIN:** \_\_\_\_\_

**3. CAPITAL CITY:** \_\_\_\_\_

## 4. Write down the journey from the farm where your food was grown, to your plate:

FROM	→	TO	→	MEANS OF TRANSPORT	→	DISTANCE
------	---	----	---	--------------------	---	----------

farm	→	capital city	→	truck	→	100 km
------	---	--------------	---	-------	---	--------

.....

.....

.....

.....

.....

.....

**Total distance travelled:** .....

**Total number of stops/transfers:** .....



**7. COMPARISON.** Imagine that the same (or a similar) food was produced 50 km from your home (by truck).

- **Imported food:** \_\_\_\_\_
- **Local alternative:** \_\_\_\_\_
- **Total transport distance (imported):** \_\_\_\_\_ km
- **“Local route”:** 50 km
- **Difference:** \_\_\_\_\_ km

**Reflect:** What does this distance difference mean for freshness, price, and the environment?

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**8. THINK AND JUSTIFY.** When is it reasonable to buy imported food, and when is it better to buy local? Consider seasonality, price, quality, food waste, and environmental and social impacts.

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# The Long Journey to Your Plate

## ACTIVITY IDEAS :

- Students draw lots to get a randomly assigned food item and then complete the tasks related to tracing its journey to the plate.
- You can conduct the draw using an online tool such as [Wheel of Names](#), or the teacher assigns each student (or group) a food item.
- One half of the class works with foods imported from EU countries, while the other half works with foods from non-EU countries. At the end, students compare their results.



**Bananas – Ecuador**



**Mango – Brazil**



**Oranges – Spain**



**Pineapple – Costa Rica**



**Lemons – Turkey**



**Kiwi – Greece**



**Tomatoes – Morocco**



**Avocado – Peru**



# The Long Journey to Your Plate



**Bell peppers - Netherlands**



**Sweet potatoes - Egypt**



**Ginger - India**



**Garlic - China**



**Coconut - Sri Lanka**



**Strawberries - Morocco**



**Almonds - USA**



**Mandarins - Croatia**

# Homegrown or Imported?

## ACTIVITY IDEAS :

- Each student receives one card and decides whether the food item can be locally produced or is usually imported.
- Students identify which foods they commonly use at home when preparing meals.
- In groups, students sort the foods into two categories – local and imported – and discuss why some are more often locally produced while others are imported.
- Students draw additional foods of their choice in the empty boxes.



**Mango**



**Buckwheat**



**Salmon**



**Pineapple**



**Rice**



**Bananas**



**Tuna**



**Avocado**



# Homegrown or Imported?



**Coffee**



**Tomatoes**



**Corn**



**Potatoes**



**Apple**



**Milk**



**Cottage Cheese**



**Cucumber**

# Homegrown or Imported?



**Beans**



**Ginger**



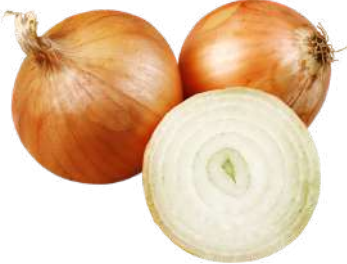
**Trout**



**Chicken Meat**



**Honey**



**Onion**



**Pumpkin Seed Oil**



**Chickpeas**

# Homegrown or Imported?



**Millet Grains**



**Bread**



**Eggs**



**Polenta**



**Soy Sauce**



**Cashews**



**Walnuts**



**Cabbage**

## Homegrown or Imported?


# LOCAL FOOD BASKET

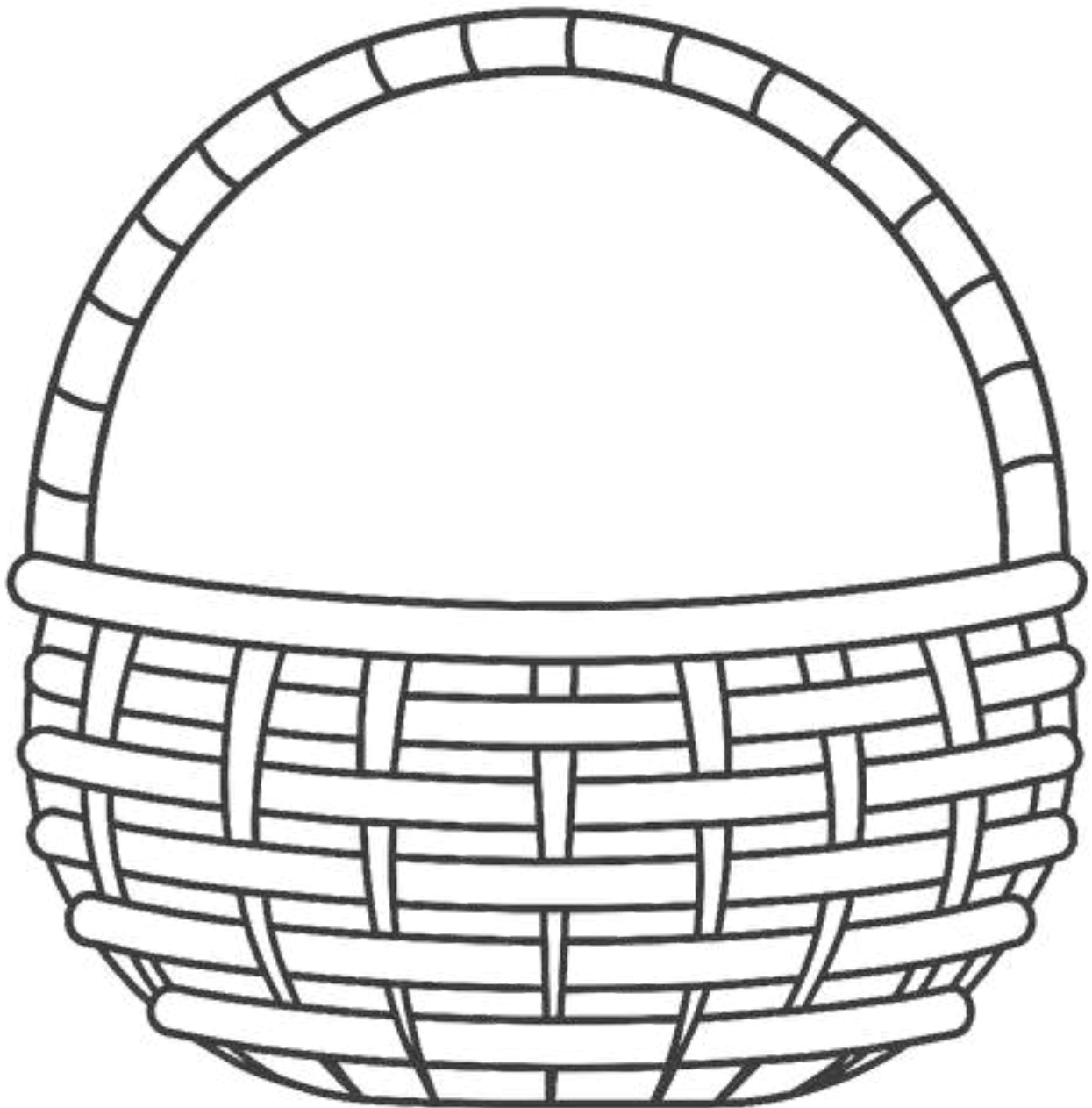
NAME:

CLASS:

DATE:

## INSTRUCTIONS:

DRAW FRUITS AND VEGETABLES THAT CAN BE GROWN IN YOUR COUNTRY INSIDE THE BASKET. YOU MAY ALSO ADD CHEESE, SALAMI, BREAD, YOGURT, HONEY, EGGS, OR OTHER LOCALLY PRODUCED FOODS FROM YOUR REGION.







A vibrant school garden scene. In the foreground, there are rows of large-leafed green plants, likely lettuce. To the right, there are purple flowers and orange flowers. In the background, a brick wall is visible with a white trellis structure. The overall scene is lush and colorful.

## CHAPTER 9

# *Modules*

The educational programme is divided into six interconnected modules that are directly linked to the school garden and its activities. Together, they provide students with comprehensive, practical insight into key sustainability topics. Each module includes clear guidelines, objectives, and activities, along with ready-to-use materials.

The educational programme consists of six thematic modules that are logically interconnected and build on one another, offering teachers and students a comprehensive insight into key sustainability topics.

#### THEMATIC MODULES:

**Module 1: Food Self-Sufficiency**

**Module 2: Environment and Biodiversity**

**Module 3: Waste Reduction and Circular Economy**

**Module 4: Developing Social Skills**

**Module 5: Sustainable Mobility**

**Module 6: Energy**

Teachers can combine the content according to students' age, prior knowledge, interests, season, and the possibilities of the school environment.

**EACH MODULE PROVIDES CLEAR IMPLEMENTATION GUIDELINES, DEFINED OBJECTIVES, A SET OF ACTIVITIES WITH EXTENSION OPTIONS, AND READY-TO-USE MATERIALS AND RESOURCES FOR DEEPER EXPLORATION.**



For easier use, the activities and materials are marked according to the age groups they are intended for. These are only recommendations – you can freely use materials intended for younger students with older students, and vice versa.



**First age group (ages 6–8)**



**Second age group (ages 9–11)**



**Third age group (ages 12–14)**

Although all activities and materials are connected to the school garden and complement one another, they are not dependent on each other. If you find that certain module content does not meet your needs, you can skip it and focus on the others. You can also combine modules – for example, complete one activity from a module, move to another, and return later.

**This flexible structure allows teachers complete freedom to adapt the learning process to their students, school context, and available resources.**





## MODULE 1

# *Food Self-Sufficiency*

In today's world, food self-sufficiency is one of the key elements of sustainable development. By integrating this topic into the the curriculum, students learn about the origins of the food they eat, understand the benefits of local production, and recognize its impact on community resilience, environmental protection, and a healthy lifestyle.

## Keywords

Environmental Studies, Science and Technology, Natural Science, Biology, Home Economics, Visual Arts, Mathematics, Language, Educational Games, Journal, Drawing, Mapping, Market, Bingo, Flashcards, Reading, Storytelling, Geography, Food Origins, Waste, Food Waste, Research, Local Food, Imported Food, Recipes, Carbon Footprint, Advertising, Challenge, Ages 6–8, Ages 9–11, Ages 12–14.

## Guidelines

The school garden is an effective tool for raising awareness about food self-sufficiency. It provides students direct contact with food production, allows them to observe growth processes, and helps them understand the importance of seasonal and local food. Moreover, as an outdoor classroom, the school garden encourages interdisciplinary learning, teamwork, and responsibility.

### 1. Taste, Compare, and Explore

- Encourage students to taste different foods (especially local ones) and express their opinions. Together, examine the origins of various foods and draw the routes on a map they travelled to reach their plates.

### 2. Teach about Food Production in Cities

- Create a classroom seasonal food calendar and connect it to the school lunch menu.
- Show students various urban gardening practices in the school garden (raised beds, container gardens, vertical gardens, etc.).
- Visit a community garden where city residents grow food for their own needs.
- Emphasize the importance of traditional dishes.

### 3. Foster a Responsible Attitude towards Food

- Teach students about meal planning, food storage, using leftovers, and composting.
- Compare local and imported foods (taste, quality, packaging) and create classroom rules to reduce food waste.

### 4. Collaborate with Parents and the Local Community

- Invite experts (local farmers, food industry workers) to share their knowledge and experiences with students.
- Organize an event for parents and the community dedicated to food production in the school garden.

## Objectives

- **Students explore where the food they eat comes from** and learn about food supply chains.
- **Students understand the advantages of locally grown** and seasonal food and recognize the importance of food self-sufficiency for both the community and the environment.
- **Students actively participate in school garden activities** – planting, cultivating, harvesting, and using the produce.
- **Students learn about various methods of urban food production** (raised beds, community gardens, vertical farms, rooftop gardens, etc.).
- **Students develop a responsible attitude towards food** by reducing waste and learning to use surplus food (e.g., composting, cooking with leftovers, proper food storage, mindful shopping, and separating organic waste).
- **Students build critical thinking skills** by reflecting on how their food choices affect the environment, their health, and the local community.
- **Students identify and test practical solutions to reduce food waste** at school and at home.
- **Students raise awareness among their peers and the local community** about the importance of food self-sufficiency and local food through posters, workshops, and school garden-based events.



# Activities



**Age group 6–8**

**Goal:** *Students build a connection between food production and consumption while developing a respectful attitude towards food.*

## 1. From Seed to Sandwich

- Students work in groups to choose one sandwich ingredient (e.g., lettuce, tomato), plant it in the garden or in pots, observe its growth, and record it in an illustrated journal. At the end, they prepare their own “garden sandwich.”



## 2. Our Garden Market

- Students organize a classroom market with products from the garden (herbs, seedlings, teas), create their own brand, and use “garden coins” for trading.

## 3. BINGO – Taste, Smell, Listen, Observe!

- Through a sensory BINGO game, students explore foods using all their senses. This activity strengthens sensory literacy and promotes a positive attitude toward different foods.

## 4. Grumpy the Food-Waster – A Story about Wasted Food

- Through storytelling and play, students discover the hidden consequences of food waste, create their own character (a hero or a grumpy food-waster), and reflect on responsible food use.





## Age group 9–11

**Goal:** *Students analyze the origin of food, evaluate dietary choices, and develop solutions for more sustainable eating habits at school and at home.*

### 1. Food Journey Map

- Students bring food packaging from home, record the origin, distance, and transport route, and plot their findings on a shared world map. They reflect on the environmental impact of food transport and the importance of local production.

### 2. Mission: Make a Meal Without Waste!

- Student groups are challenged to create a tasty, practical recipe using imaginary leftovers – without producing any waste. This activity fosters creativity, planning skills, and discussions about food waste. At the end, students compile a Zero-Waste Recipe Booklet.

### 3. Season Detectives

- Students are divided into groups, each researching one month of the year to find out which foods are seasonal and which traditional dishes can be prepared. They create an annual Seasonal Food Calendar with drawings, recipes, and short posts for the school website.



### 4. Tasty Investigation

- Students compare local and industrially produced foods, individually or in groups. They record their observations – taste, appearance, texture – and discuss the benefits of local food. The results are presented on a classroom poster.



## Age group 12–14



**Goal:** Students critically evaluate the impact of food choices, plan improvements, and design creative solutions for a sustainable food future in their school and community.

### 1. Green Makeover: Design Your Edible Corner

- Students work individually or in groups to design an edible space (e.g., a herb corridor, fruit border, or flowering vegetable bed) around the school. They create a model or digital plan, include native plants, and prepare a seasonal recipe inspired by their design. The aim is to combine botany, aesthetics, and gastronomy into a single concept.



### 2. A Meal with a Footprint: How Much CO<sub>2</sub> Do We Eat?

- Students analyze a common meal (e.g., a school lunch or home-cooked dish), calculate the carbon footprint of its ingredients, and propose a lower-emission, sustainable version. Using online calculators, they research ingredient origins and create a digital poster showing the recipe, emission comparison, and suggestions for zero-waste storage.

### 3. Don't Believe Everything You Eat – Food Trends Under the Microscope

- Students work in groups to analyze selected food advertisements (e.g., energy drinks, fast food, supplements), uncover advertising strategies, and create their own campaign promoting local and seasonal food. They design posters, slogans, videos, or infographics presenting sustainable alternatives to popular trends.



### 4. Our Kind of Food: Idea Carousel for a Better World

- Students investigate food-related challenges at school or in the community (e.g., food waste, repetitive menus, lack of local produce) and develop project-based solutions – such as a prototype, model, podcast, digital campaign, or game – to encourage sustainable change.



# Module 1: Food Self-Sufficiency – LEARNING EXPERIENCES

## Age group 6–8



### **From Seed to Sandwich**

- Picture journal
- Drawing, cutting, linking
- What can we do with leftovers?

### **BINGO – Taste, Smell, Listen, Observe!**

- Educational game
- Picture cards
- Group work

### **Grumpy the Food-Waster**

- Story-based activity
- Educational game
- Food waste awareness



## Age group 9–11



### **Food Journey Map**

- Product origin
- Food transport
- Carbon footprint

### **Mission: Create a Zero-Waste Meal!**

- Group work
- Zero-waste recipe
- What to do with leftovers?

### **Taste Investigation**

- Local vs. imported foods
- Food tasting
- Research worksheet





**Don't Believe Everything You Eat – Food Trends Under the Microscope**

- Advertisement analysis
- Worksheet
- Critical thinking

**A Meal with a Footprint**

- Carbon footprint
- Worksheet
- Imported foods

**Green Makeover – Design Your Edible Corner**

- School garden
- Recipe creation
- Class exhibition

**Our Food – Idea Carousel for a Better World**

- Group work
- Problem-solving
- Creative project development





# From Seed to Sandwich

## TEACHER PREPARATION

1. Print the worksheets.
2. Begin with a discussion about sandwiches and their ingredients. Ask: “Are the ingredients local?”
3. Talk with students about where different foods come from. Encourage them to consider:
  - different ways food is produced (e.g., home gardens, industrial farms, greenhouses),
  - various stages of processing (e.g., milk → cheese → sandwich),
  - local versus long-distance food sources (e.g., an apple from a nearby orchard or from a supermarket – still grown on a farm).

## STEP-BY-STEP GUIDE

1. Students complete the worksheets, create a visual diary, draw, take photos, glue items in, and arrange images in the correct order. They link foods to their place of origin or production and match numbers to pictures.
2. Students understand where food comes from, connect ingredients to natural and cultural resources, and reflect on the idea of local food self-sufficiency.





## REFLECTION QUESTIONS

1. Can you make a sandwich using only local ingredients?
2. Which professions were involved in the process “from seed to plate”?

## EXTENSION ACTIVITIES

1. Organize an exhibition of students’ “sandwich projects.”
2. Ask students to explain to their parents how to make a sandwich using only locally produced ingredients.

## NOTES FOR TEACHERS

In the “Where does food come from?” task, many foods may have more than one correct origin or production route. The purpose of the activity is not only to find “the right answer,” but also to encourage thinking and discussion about the journey of food from producer to plate.





# MY SANDWICH: PLANT OBSERVATION – VISUAL DIARY





NAME:

CLASS:

DATE:

**MY PLANT IS CALLED:**

DRAW OR ATTACH PHOTOS TO SHOW HOW YOUR PLANT GROWS. OBSERVE IT EACH WEEK AND UPDATE YOUR DIARY WITH NEW DRAWINGS OR NOTES.

WEEK	DRAW OR ADD A PHOTO	WHAT DID YOU NOTICE?
		
		
		
		



# STEPS: FROM SEED TO SANDWICH

NAME:

CLASS:

DATE:

**CUT OUT** THE PICTURES AND **STICK** THEM IN THE CORRECT ORDER.

1.



2.



3.



4.



5.



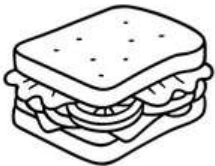
1.



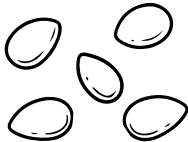
2.



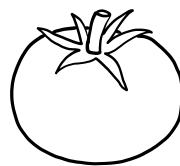
3.



SANDWICH



SEED



CROP



GROWTH



SEEDLING

**CONNECT THE DOTS FROM 1 TO 20.**

What picture do you see?

When you're done, color it in!



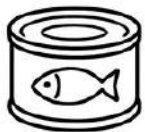


# WHERE DOES FOOD COME FROM?

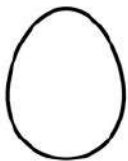
MATCH EACH FOOD ITEM TO ITS PLACE OF PRODUCTION OR PROCESSING.



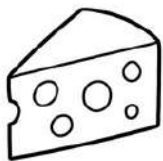
TOMATO



TUNA



EGGS



CHEESE



HERBS



PEPPER



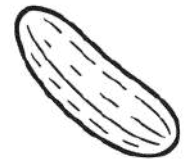
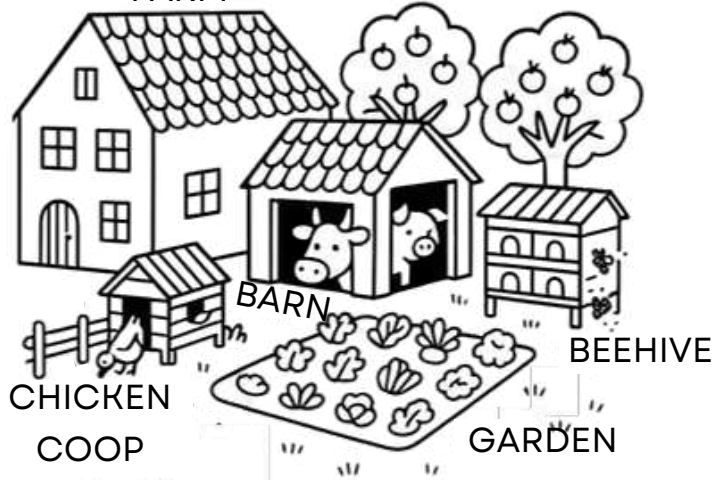
YOGURT

BAKERY



FARM

ORCHARD



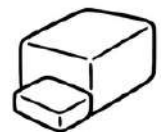
CUCUMBER



HAM



BREAD



BUTTER



APPLE



CABBAGE



HONEY

FACTORY





# DRAW YOUR SANDWICH

NAME:

CLASS:

DATE:

**YOU'VE MADE YOUR OWN SANDWICH!**

DRAW IT AND WRITE WHAT'S INSIDE (OR LABEL IT).

**NAME OF MY SANDWICH:**

**MY SANDWICH DRAWING:**



**INGREDIENTS INSIDE:**



# MY SANDWICH TASTE TEST

NAME:

CLASS:

DATE:



**CIRCLE** WHAT APPLIES TO YOUR SANDWICH AND **COMPLETE** THE SENTENCES.



## MY SANDWICH CRUNCHES BECAUSE OF:



LETTUCE



CUCUMBER



CARROT



CABBAGE

NOTHING



RADISH



BREAD



PEPPER

OTHER:



## MY SANDWICH SMELLS LIKE:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## MY SANDWICH HAS COLORS:



RED



ORANGE



YELLOW



GREEN



BROWN



WHITE

OTHER: OTHER:



## I LIKE IT BECAUSE:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# WHAT DID I DO WITH MY LEFTOVERS?

NAME:

CLASS:

DATE:

WHAT DID YOU DO WITH THE PEELS, INEDIBLE PLANT PARTS, OR LEFTOVER BITS OF YOUR SANDWICH? DRAW OR WRITE YOUR ANSWER.



A large rectangular area enclosed by a dashed line, intended for drawing or writing an answer to the question above.



# BINGO – Taste, Smell, Listen, Observe!

## PREPARATION FOR TEACHERS

1. Prepare 9 different foods (e.g. cucumber, pepper, carrot, apple, grape, cabbage, radish, mint, lettuce).
2. Each food should have a matching picture or drawing.
3. Create 4–6 different Bingo cards (each a 3×3 grid with 9 pictures of foods). Print and distribute one card per student.
4. Prepare small cards with sensory descriptions, such as: crunchy, sweet, herb-scented, sour, juicy, green, has a hard peel, soft inside.
5. Place the description cards in a small box or bag for random selection.

## STEP-BY-STEP GUIDE

1. The teacher (or a student) draws one description card and reads it aloud.
2. Students look at their Bingo card and circle the food they think matches the description.
3. When a student gets three in a row (horizontally, vertically, or diagonally), they call out “BINGO!”
4. Check the answers together – students should explain their choices using their senses (taste, smell, sight, touch).
5. If a student doesn’t recognize a food, they can see, touch, smell, or taste it. The teacher should have a whole sample (e.g. a carrot) and cut it into pieces for tasting.
6. At the end, divide students into 4–5 groups. Each group draws or selects one of the 9 foods and receives a sample (whole and cut pieces). They perform a sensory investigation and prepare a poster or information sheet describing their food (appearance, texture, taste, smell). Groups then present their findings to the class.



## REFLECTION QUESTIONS

1. Do you recognize a food faster by tasting it or by touching it?
2. Do you recognize a food faster by touching it or by seeing it?
3. Do you recognize a food faster by tasting it or by hearing its description?

## EXTENSION ACTIVITIES

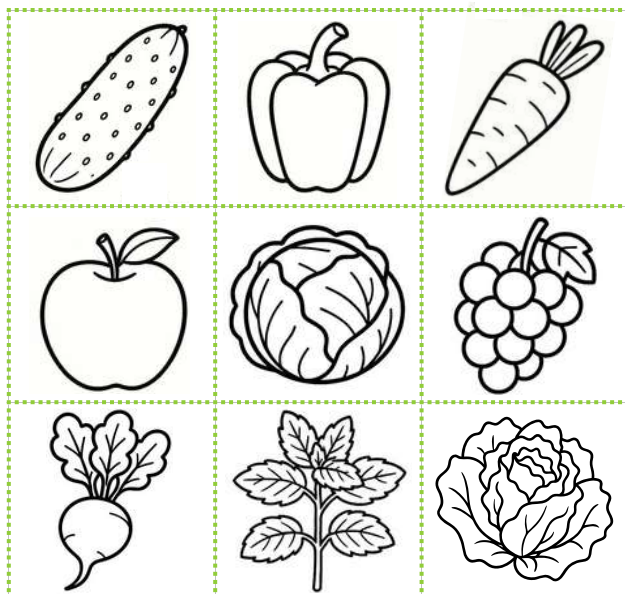
1. Sensory Box Game: Guess the food using just one sense (e.g. touch or smell).
2. Use digital tools (Canva, PowerPoint) to create a sensory learning slideshow.
3. Make a digital quiz about food properties using *Kahoot* or a similar tool.



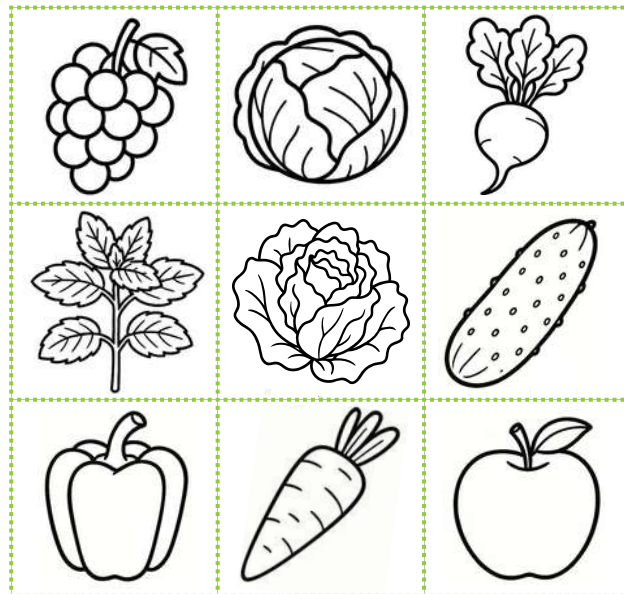


# Example Bingo Card – 9 Fields

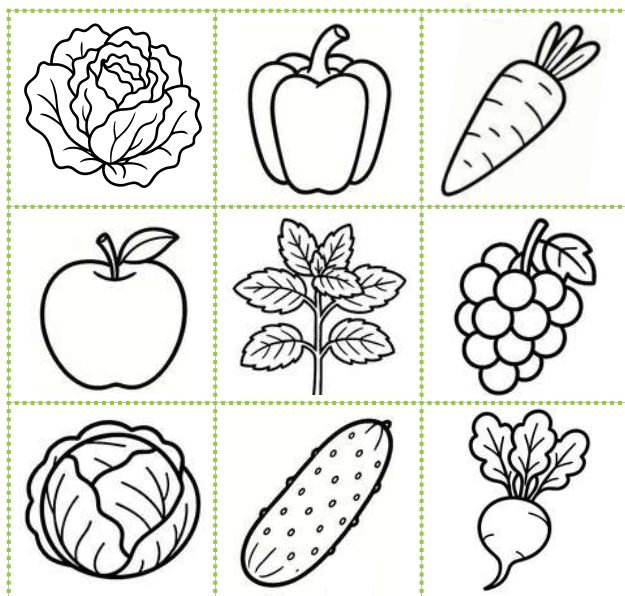
Card 1



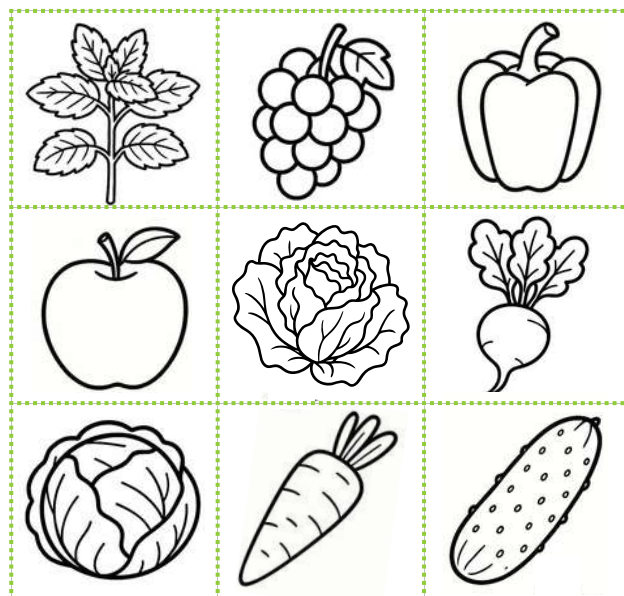
Card 2



Card 3








Card 4





# Examples of Property Cards (for Drawing)

	<b>SIGHT</b> 	<b>SMELL</b> 	<b>TASTE</b> 	<b>TOUCH</b> 	<b>SOUND</b> 
<b>CUCUMBER</b>	GREEN, ELONGATED	MILD, FRESH	WATERY, SLIGHTLY SWEET	SMOOTH, COOL	CRUNCHY
<b>PEPPER</b>	RED / YELLOW / GREEN, SHINY	SWEET, FRESH	SWEET, SLIGHTLY BITTER	FIRM, SMOOTH, TAUT	CRUNCHY
<b>CARROT</b>	ORANGE, ELONGATED	EARTHY, FRESH	SWEET	HARD, ROUGH	VERY CRUNCHY
<b>CABBAGE</b>	GREEN, ROUND, LEAFY	CABBAGEY, STRONG	SLIGHTLY BITTER, SWEET	SMOOTH, FIRM	CRUNCHY, SQUEAKY
<b>RADISH</b>	RED WITH SOME WHITE, ROUND	SHARP, SLIGHTLY SPICY	SPICY, REFRESHING	FIRM, SMOOTH	A CRISP SNAP
<b>LETTUCE</b>	GREEN, LEAFY	GENTLE, MILD	MILD, SLIGHTLY BITTER	SOFT, MOIST	SLIGHT RUSTLING
<b>APPLE</b>	RED / GREEN, ROUND	FRUITY, FRESH	SWEET, TART	FIRM, SMOOTH	CRUNCH WHEN BITTEN
<b>GRAPES</b>	GREEN / PURPLE, SMALL, ROUND	SWEET, FRUITY	VERY SWEET, SLIGHTLY TART	SMOOTH SKIN, JUICY FLESH	SOFT POPPING SOUND
<b>MINT</b>	DARK GREEN, LEAFY	STRONG, FRESH (MENTHOL)	REFRESHING, COOL	SLIGHTLY FUZZY	QUIET, SLIGHT RUSTLE WHEN TOUCHED



# Grumpy the Food-Waster

## PREPARATION FOR TEACHERS

1. Prepare picture cards (you can use magazine cutouts or printed images) and a large “waste bin poster” divided into six sections: Fruit and Vegetables, Dairy and meat, Professions (farmer, cook, shopkeeper, driver ...), Transport (tractor, van, ship ...), Natural Resources (water, soil, fuel ...), Packaging (plastic, glass, tin ...).

## STEP-BY-STEP GUIDE

1. **Storytime:** Read the story Grumpy the Food-Waster, about a child who turns up his nose at every kind of food until his mother shows him how many resources and work are wasted when food ends up in the bin.
2. **Class Discussion:** After reading, guide a short reflection together:
  - Which natural resources did Grumpy the Food-Waster waste?
  - Who worked to bring the food to his table?
  - What can we do to waste less food?
3. **Educational Game – Grumpy’s Waste Bin:** In small groups, students draw picture cards and place them in the correct section on the waste bin poster. Each group explains its reasoning (e.g. “This is water – lettuce can’t grow without it”). Tip: *Some cards can fit into more than one category – encourage reasoning and discussion.*

## REFLECTION QUESTIONS

1. Do you sometimes behave like Grumpy the Food-Waster?
2. What happens to food after we throw it away?



## EXTENSION ACTIVITIES

1. Students create a poster about a chosen food item (e.g. an apple, yogurt). They illustrate everything needed for it to reach the table – professions, packaging, natural resources – and explain what happens if it’s wasted. Display the posters around the classroom or in the school hallway.



## STORY: GRUMPY THE FOOD-WASTER

EVERY STORY USUALLY BEGINS SOMETHING LIKE THIS:

“ONCE UPON A TIIIIIME, FAR BEYOND THE HILLS AND ACROSS TEN RIVERS, THERE LIVED...” WELL, OUR STORY DOESN'T BEGIN LIKE THAT. NO, BECAUSE OUR MAIN CHARACTER IS STILL ALIVE TODAY. DON'T BELIEVE ME? THEN LET ME ASK YOU SOMETHING – BUT PROMISE TO TELL THE TRUTH, OKAY? WHEN YOU GET A BOWL OF BROCCOLI, CAULIFLOWER, AND CARROT SOUP AT SCHOOL, WHAT DO YOU SAY? IF YOU WRINKLE YOUR NOSE, TWIST YOUR MOUTH INTO A FROWN, AND SAY “EWWW!”, THEN A VERY SPECIAL LITTLE CREATURE IS AT WORK. YOU DON'T BELIEVE ME? LET ME INTRODUCE YOU TO GRUMPY THE FOOD-WASTER.

GRUMPY'S BIGGEST TALENT IS COMPLAINING. MOST OF ALL, HE COMPLAINS ABOUT FOOD. IT DOESN'T MATTER WHAT IT LOOKS LIKE OR WHERE IT COMES FROM – HE TASTES IT, MAKES A FACE, AND THROWS IT AWAY. “I WON'T EAT THAT WRINKLY CARROT!” HE GROWLS. “IT MUST TASTE WEIRD!” “GIVE ME LOOOOOTS OF SOUP! OH, YUCK! THIS SOUP IS TOO GREEN! IF I EAT A PIECE OF BROCCOLI, I'LL PROBABLY GET PINK SPOTS ALL OVER MY FUR!”

ONE MORNING, WHEN GRUMPY WOKE UP AND STRETCHED – FROM THE TIP OF HIS TAIL TO THE CLAWS ON HIS PAWS – HE NOTICED SOMETHING STRANGE. INSTEAD OF A DELICIOUS BREAKFAST, A BIN FULL OF HALF-EATEN FOOD WAS WAITING FOR HIM. “HMMM,” HE THOUGHT WHILE DIGGING THROUGH THE LEFTOVERS, “WHO WOULD THROW AWAY A PERFECTLY GOOD PIECE OF BREAD?” “GRUMPY, THAT'S THE FOOD YOU THREW AWAY,” SAID HIS MOTHER GENTLY. “ME?!” HE ASKED IN SURPRISE. “YES,” SHE SAID. “HAVE YOU EVER THOUGHT ABOUT THAT? WHEN YOU THROW AWAY FOOD, YOU ALSO THROW AWAY THE HARD WORK OF FARMERS WHO SOWED THE SEEDS AND WATERED THEM. YOU WASTE ALL THE FUEL USED TO BRING THE FOOD TO THE SHOP. AND YOU WASTE THE TIME I SPENT PREPARING A TASTY, HEALTHY MEAL FOR YOU.” GRUMPY'S EYES GREW WIDE. “I NEVER THOUGHT ABOUT THAT,” HE ADMITTED. “I PROMISE I'LL TRY TO GIVE FOOD A CHANCE – EVEN THE FOODS I DIDN'T LIKE BEFORE. AND I'LL ONLY TAKE AS MUCH AS I CAN EAT.”





OF COURSE, THAT DAY GRUMPY STILL GRUMBLED – ABOUT HIS COLORFUL SOCKS, THE MINTY SMELL OF HIS TOOTHPASTE, AND THE SUN SETTING TOO EARLY. BUT WHEN HE LAY IN BED THAT NIGHT, HE COULDN'T STOP THINKING ABOUT WHAT HIS MOTHER HAD SAID. “FARMERS, WATER, FERTILIZER, FUEL, SHOPS, MOM ... BY THREE CURLY PIGTAILS! I NEED TO FIND OUT IF SHE'S RIGHT.”

“HEY, YOU – YES, YOU – STILL SITTING THERE, NOT ASLEEP YET! I'M LOOKING FOR THE SMARTEST RESEARCHERS, THE MOST CURIOUS DETECTIVES, AND THE BRAVEST HEROES. IS THAT YOU? WILL YOU HELP ME FIND OUT IF MOM WAS RIGHT – AND WHETHER THROWING FOOD AWAY WASTES ALL THAT TOO? SHHH... SO SHE DOESN'T HEAR US. COME ON – LET'S PLAY A GAME TOGETHER! LISTEN CAREFULLY TO THE INSTRUCTIONS AND RULES...”

*(AUTHOR: TINA HRIBAR)*





# Game Rules (Teacher's Instructions)

## PREPARATION FOR TEACHERS

1. Divide students into groups of four (or adjust group size depending on the total number of participants).
2. Each group receives: one Grumpy's Waste Bin poster with colored sections, a set of 24 cards, and a copy of the game rules.
3. Shuffle the cards thoroughly and place them face down (you can also put them into small bags or envelopes for drawing).
4. Encourage students to observe Grumpy's Waste Bin carefully. It shows the food that Grumpy the Food-Waster threw away. The bin is divided into six color-coded zones, each marked with an icon that represents the type of card that belongs there.

### The Six Color Zones Represent:

- **Fruit and Vegetables** (cards: broccoli, carrots, bananas, apples),
- **Dairy and Meat Products** (cards: salami, chicken drumstick, cheese, butter),
- **Professions** (cards: cook, farmer, driver, shopkeeper),
- **Natural Resources** (cards: soil, water, fertilizer, fuel),
- **Packaging** (cards: glass jar, milk carton, yogurt cup, sardine can),
- **Transport** (cards: tractor, ship, car, truck).

## STEP-BY-STEP GUIDE

1. The first player draws a card, looks at the picture, and decides which color zone it belongs to on Grumpy's Waste Bin. The next player continues by drawing a new card and placing it in the correct zone. The goal is for the group to sort all 24 cards into six categories. After the game discuss with students: What did they learn? How can they reduce food waste at home or at school?

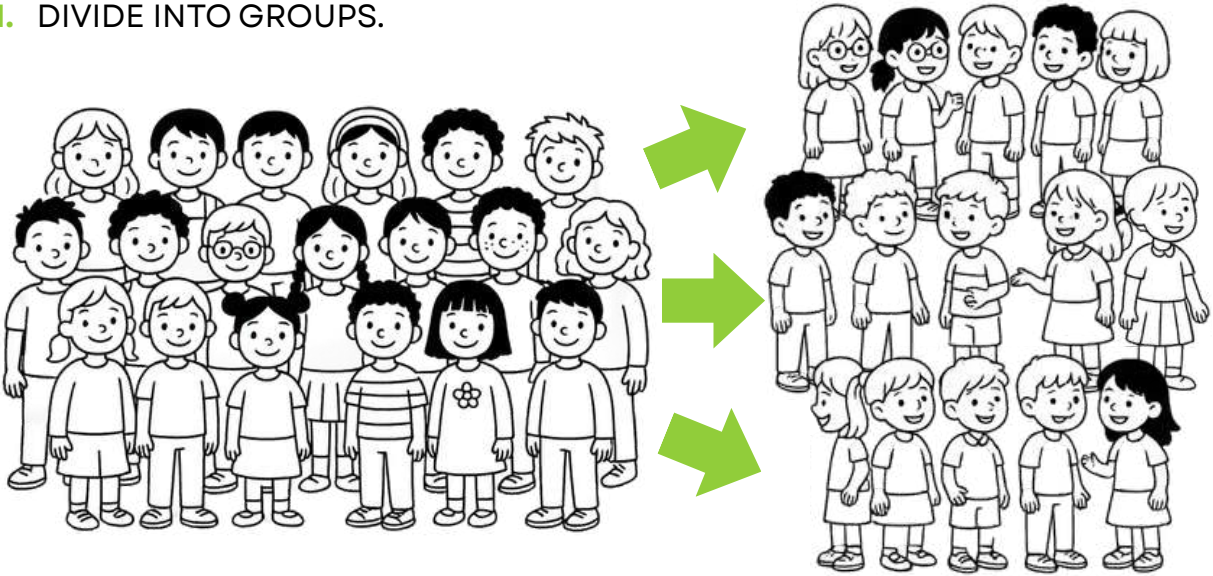
## EXTENSION ACTIVITIES

1. For an advanced version of the game: Keep the cards face down, the first student draws a card, looks at the image, and says a sentence about it before placing it in the correct zone. The next player draws a new card and continues the story by explaining how their image connects to the previous one.

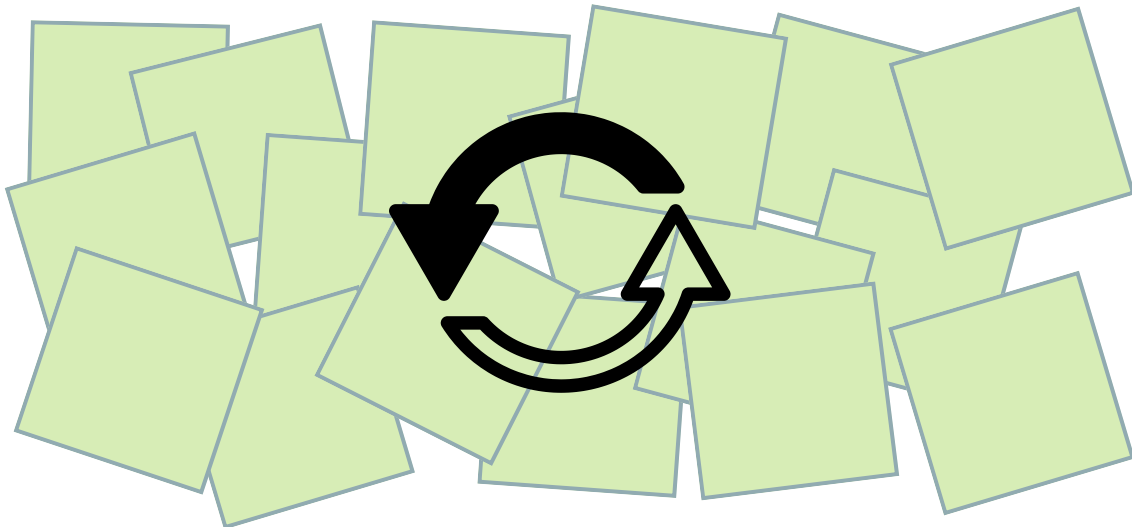


# GAME RULES FOR STUDENTS

1. DIVIDE INTO GROUPS.



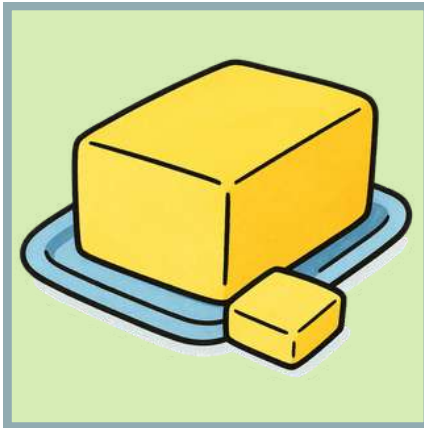
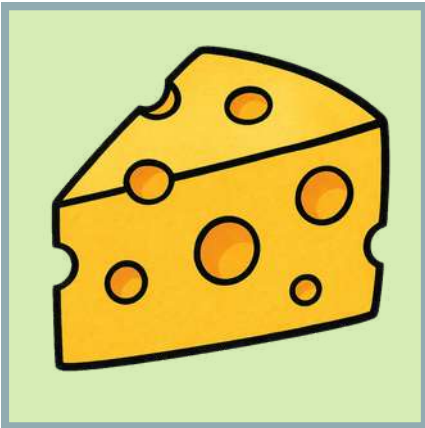
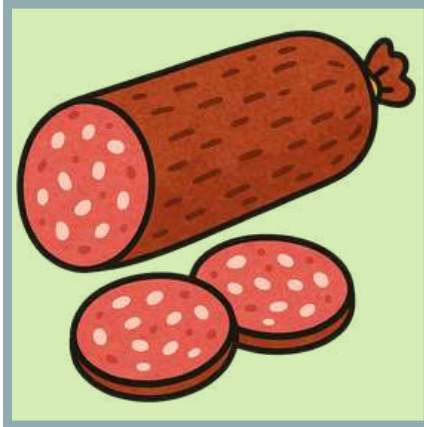
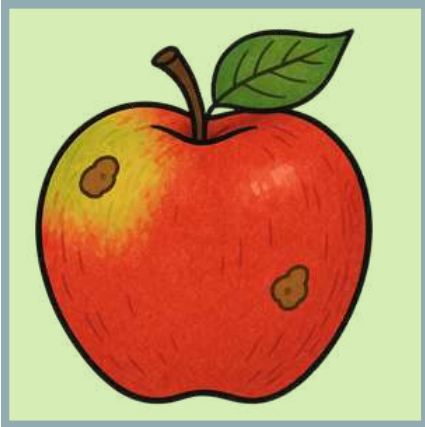
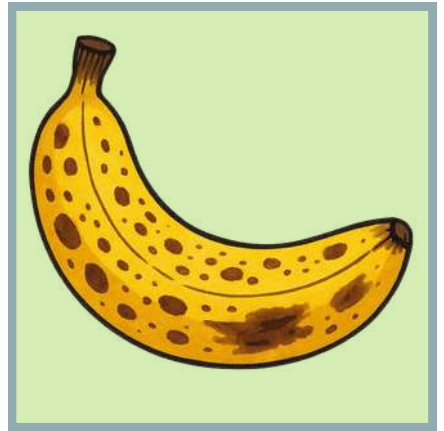
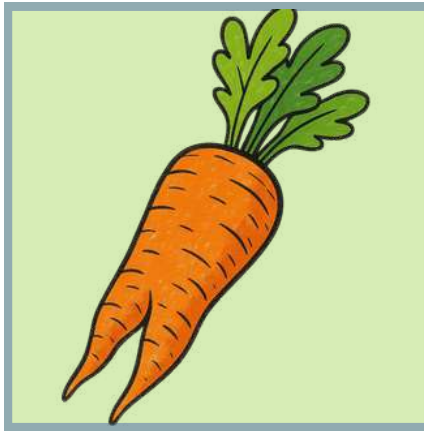
2. TURN ALL THE CARDS FACE DOWN AND SHUFFLE THEM WELL.



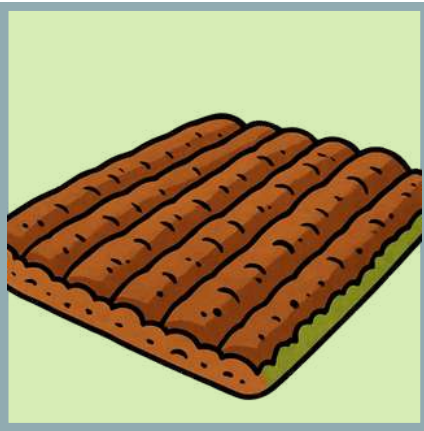
3. THE FIRST PLAYER DRAWS ONE CARD, LOOKS AT THE PICTURE, AND PLACES IT IN THE CORRECT COLORED SECTION OF GRUMPY'S WASTE BIN.



# PLAYING CARDS

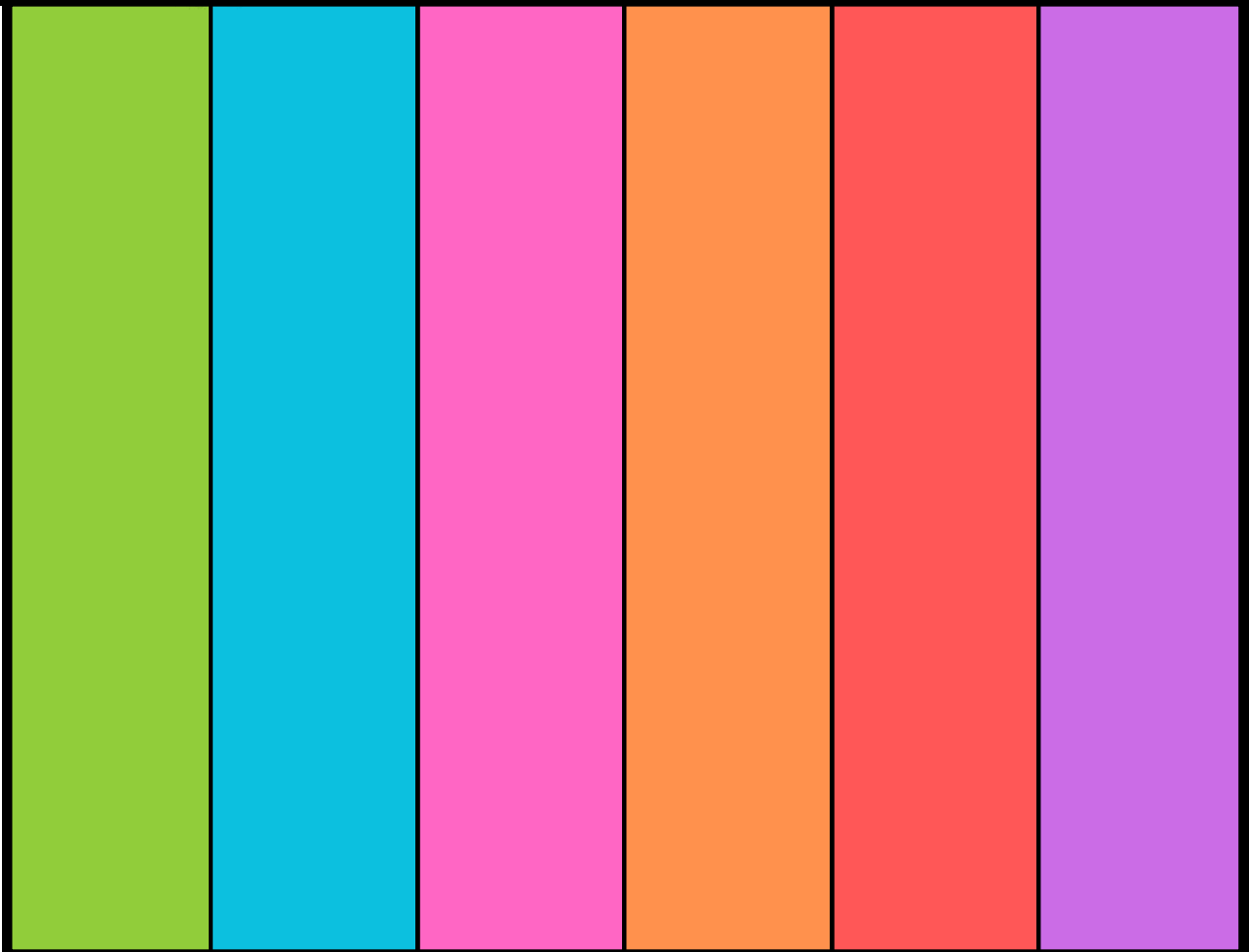


# PLAYING CARDS





# GRUMPY'S WASTE BIN





## How to Make “Grumpy’s Waste Bin”

You can print it on A5 paper and laminate it for durability.

If you want a larger version, draw it on poster paper or cardboard.

Use six different colors to create the sections and decorate each with relevant images – cut from magazines or draw them yourself:

- Green Zone: fruit and vegetables
- Blue Zone: dairy and meat products
- Pink Zone: food-related professions
- Orange Zone: transport and food-processing vehicles
- Red Zone: natural resources used for growing food
- Purple Zone: packaging materials

Adjust the size of the cards to match your waste bin layout. Laminating the printed cards will make them reusable for future classes.





# Food Journey Map

## PREPARATION FOR TEACHERS

1. Ask students to bring empty food packaging or labels from home (e.g., juice, milk, yogurt, apple).
2. Prepare a mystery box filled with various food packaging (or printed adverts) showing the country of origin. Include diverse examples such as organic products or exotic fruits.
3. Collect a few local foods from the school kitchen (bread, apple, milk).
4. Draw a large world map on a poster. Clearly mark your country and leave space for sticky notes.

## STEP-BY-STEP GUIDE

1. Choose a product: Each student selects one food item or piece of packaging – either their own or one from the mystery box.
2. On their worksheet, students: draw the product, write its name, identify the country of origin (as shown on the package), estimate the distance traveled (teacher can assist using a map or app), reflect on the carbon footprint of the product.
3. Students copy the basic data onto a sticky note (product name, country, kilometers traveled). They place the note on the map at the country of origin and draw a line connecting it to their country.
4. Together, analyze the results:
  - Which product traveled the farthest?
  - Which are local?
  - What does this mean for the environment, health, and community?





## REFLECTION QUESTIONS

1. Which product traveled the farthest?
2. How many kilometers did all the foods travel in total?
3. Which ingredients are local and which are not?
4. Why is locally produced food better for the environment?
5. What does “carbon footprint” mean?

## EXTENSION ACTIVITIES

1. Use online tools to estimate the carbon footprint (*Food miles calculator*, *Free food carbon footprint calculator*).
2. Each group prepares a short presentation explaining: where the food is grown, who produces it, how it reaches your country, whether it could be produced locally, how far it travels, and whether it is seasonal.
3. Create a hallway exhibition (poster + sticky notes + packaging).
4. Organize a local food tasting event and invite local producers to join.



# Food Journey Map








Name:

Class:

Date:

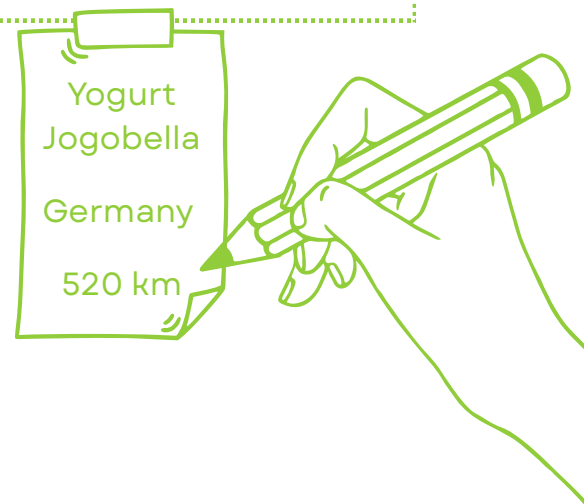
Carefully examine the packaging and find out which country the product comes from. Then complete the worksheet below.

<b>Draw the product</b> 	<b>Country of origin</b> 
<b>Product name</b> 	<b>Distance traveled (km)</b>  <b>Estimated carbon footprint</b> 

On a sticky note, write:

**product name – country of origin – distance traveled (km).**

Attach your note to the classroom world map and draw a line connecting the country of origin to your country.



**Think about:**

- Do you know a similar product produced locally?
- Which option is better for the environment – local or imported food?
- Why?



# Mission: Create a Zero-Waste Meal!

## PREPARATION FOR TEACHERS

1. Prepare six A4 group challenge sheets, each showing different examples of leftover food (you can use real samples, photos, packaging, or photocopies).
2. If possible, prepare a box of real, safe, packaged leftover foods for demonstration.
3. Prepare food category cards – vegetables, fruit, grains, dairy, meat, spices, etc.
4. Bring cookbooks, magazines, or printed recipes from the school library and encourage students to bring one from home.
5. Prepare a worksheet for recording the recipe (or let students use their notebooks).

## STEP-BY-STEP GUIDE

1. Divide students into six groups of 4–5 members.
2. Each group receives one A4 challenge sheet with four food items (leftovers or imperfect produce).
3. Groups brainstorm how to reuse the ingredients instead of throwing them away.
4. Design a zero-waste recipe: Each group creates a recipe that includes at least two of the given food items.
5. Students fill out their worksheet, writing down the recipe and describing how their solution prevents food waste.





## REFLECTION QUESTIONS

1. Which ingredients would you most like to use, and why?
2. What usually happens to this type of leftover food?
3. Can you combine these ingredients into a tasty new dish?
4. How could you store the dish to make sure no food goes to waste?

## EXTENSION ACTIVITIES

1. Students prepare their zero-waste meal in the home economics classroom or at home and bring a photo of the final dish.
2. Organize a Zero-Waste Recipe Exhibition (wall display, booklet, or QR code gallery).
3. Collect all recipes in a digital school cookbook or post them on the school website.
4. Use digital tools (e.g., Canva, Book Creator) to design recipe cards and cover pages.



# Worksheet

# Our Zero-Waste Meal



Group name:

Class:

Group members:

Dish name:



Ingredients:

Illustration of the dish:

Preparation steps:



What would normally be thrown away, and how did you use it in your dish?

What can you do with any leftovers from your dish?



- Store it in the fridge.
- Freeze it.
- Make another dish (which one?).
- Other:



# GROUP CHALLENGES

## Group 1



Stale bread



Yogurt close to its expiry date



Leftover pasta



Clean eggshells

## Group 2



Overripe apple



Potato peels



Overripe tomato



Cooked rice

## Group 3



Lettuce leaves



Leftover couscous



Broccoli stem



Compote juice



#### Group 4



Leftover vegetable soup



Orange peel



Leftover buckwheat porridge



Overripe banana

#### Group 5



Leftover mashed potatoes



Fermented milk



Apple peels



Stale croissant

#### Group 6



Leftover cereal



Old carrot



Banana peel



Cheese rind



# Taste Investigation

## PREPARATION FOR TEACHERS

1. Prepare pairs of food samples for comparison (e.g., apples, cheese, bread, yogurt, tomatoes):
  - A local apple (e.g., from the school garden) vs. an imported, waxed apple
  - Homemade bread vs. white sliced bread
  - Plain yoghurt vs flavored yoghurt
  - Fresh tomato vs. tinned tomato
  - Farmhouse cheese vs. processed cheese
2. Label each sample with a number or letter (no brand names) for a blind tasting.
3. Prepare evaluation worksheets, water for rinsing their mouths, and napkins.
4. Ensure proper hygiene (washed hands, separate plates, serving with gloves or tongs, and individual cutlery).

## STEP-BY-STEP GUIDE

1. Tasting: Students taste two samples of the same type of food in pairs or small groups.
2. Individual evaluation: Each student fills in the worksheet, describing appearance, smell, taste, and giving their opinion. Encourage them to guess which product is local and which is industrially produced.
3. After the tasting, reveal where each food comes from. Discuss together whether students guessed correctly and what differences they noticed in taste, texture, and smell.
4. Each group creates a poster, collage, or infographic titled “*What Did We Discover?*” using the findings from their worksheets – descriptions, opinions, and arguments.





## REFLECTION QUESTIONS

1. Why do locally produced foods often have a different taste, texture, or smell?
2. What are the benefits of eating more local food?
3. Were all industrially produced foods of lower quality? Why or why not?
4. Why do some foods contain added flavorings, colorants, or wax coatings?
5. How can we identify high-quality local food at home?

## EXTENSION ACTIVITIES

1. Collecting Findings: Students prepare a short report, article, or infographic about their findings (for display or the school newsletter).
2. Group Cooking: Prepare a healthy, seasonal meal using only foods identified as local.
3. Website Feature: Students create a “Top 3 Local Foods” list and share their impressions on the school’s website.
4. Garden Connection: Reflect – have you grown any of these foods in the school garden?



# Taste Investigation



Date:

Class:

Name:

## WORKSHEET

Taste the prepared foods and complete the worksheet.



FOOD (WRITE THE NAME)	HOW DOES IT LOOK?	HOW DOES IT SMELL?	HOW DOES IT TASTE?	WHICH ONE DO YOU PREFER? WHY?	WHICH ONE DO YOU THINK IS LOCAL?
A					
B					
C					
D					
E					
F					
G					
H					



# Don't Believe Everything You Eat - Food Trends Under the Microscope

## TEACHER PREPARATION

1. Prepare a selection of advertisements (videos, online images, posters, or leaflets – e.g., for fast food, energy drinks, “miracle” supplements, protein bars, etc.).
2. Provide internet access, a projector, or computers/tablets for viewing ads.
3. Prepare a worksheet or a template for ad analysis.
4. Collect examples of local, seasonal, or traditional foods (images, recipes).
5. Provide A3 paper, colored pencils, or access to digital design tools (e.g., Canva, PowerPoint).

## STEP-BY-STEP GUIDE

1. **Analyze food advertisements:** Students work in groups of 3–4. Each group chooses or receives one ad (e.g., burger, energy drink, crisps, protein bar).
2. Using the worksheet, they analyze:
  - visual, emotional, and language techniques,
  - how the ad targets youth (speed, price, trendiness, taste),
  - whether nutritional claims are accurate,
  - product background (processing, origin, ingredients).
3. **Hold a critical discussion:** Groups present their ad and analysis. As a class, discuss why these foods are popular and their potential impacts on health, the environment, and consumer habits.





- 4. Create an awareness campaign:** Design a poster, slogan, short video, or digital advert promoting local, seasonal food. Include: a local ingredient or dish, a campaign name and slogan, a truthful but engaging message, and benefits for health, environment, and community. Groups present their work to the class (or a wider audience). Optional peer-voting awards: Most Feasible, Most Creative, Most Persuasive.

## REFLECTION QUESTIONS

1. Do you see more ads that promote healthy lifestyles or unhealthy products?
2. For one day, observe the ads you encounter – how many of them promote local or healthy food? Who sponsors them?

## EXTENSION ACTIVITIES

1. Interdisciplinary links: Connect with language arts (critical analysis of advertising language) and visual arts (poster design).
2. Exhibition: Display students' campaigns in the school canteen, library, or at a school fair.



# Ad Analysis

## WORKSHEET



Group name:

Group members:

Class:

Product name:

.....  
.....  
.....



**Type of advertisement** (video, poster, digital advert, etc.):

**Target audience:**

.....  
.....

.....  
.....



**Visual elements that attract attention:**



.....  
.....  
.....

**What words, phrases or slogans are used?**

**Why is this product appealing to young people?**

.....  
.....  
.....

.....  
.....  
.....



**What is the product's nutritional value? (Check the nutrition label.)**

**Is the product locally produced? Is it seasonal?**

.....  
.....  
.....

.....  
.....  
.....

**What would be a more sustainable choice?**

.....  
.....  
.....





# Meal with a Footprint: How Much CO<sub>2</sub> Do We Eat?

## TEACHER PREPARATION

1. Prepare a short explanation of the concept of food carbon footprint (food production can account for up to 30% of all greenhouse gas emissions).
2. Choose one example of a school meal, or let students pick a meal they often eat at home (e.g., spaghetti with meat sauce, sandwich, pizza).
3. Prepare a list of online carbon footprint calculators and reliable sources for food emission data.
4. Divide students into groups of 3–4.

## STEP-BY-STEP GUIDE

1. **Analyzing a typical meal:** Each group selects one meal and breaks it down into its main ingredients (four key ingredients). For each ingredient, students record: its origin (country of production), production method, level of processing, type of packaging, and transport distance.
2. **Calculating the carbon footprint:** Using online resources or calculators, students estimate the carbon footprint (in grams or kilograms of CO<sub>2</sub> per kilogram of food) for each ingredient. They should consider whether the ingredient is local or imported (transport distance!), whether it is seasonal, how processed it is (e.g., sausage vs. cooked lentils), and the production method (organic, industrial, homegrown, etc.).
3. **Designing a more sustainable version:** Groups brainstorm how to reduce emissions – by replacing ingredients, changing the recipe, or using local, plant-based, or seasonal options. They write a new recipe and add a practical storage tip for leftovers or fresh ingredients.
4. **Presentation:** Each group creates a poster or digital presentation comparing the original and the improved version of the meal. Include name of the dish, the estimated carbon footprint before and after the change (approx. kg CO<sub>2</sub>), suggested ingredient swaps, and practical tips for reducing emissions at home.



## REFLECTION QUESTIONS

1. Which food do you often eat at home that has the highest carbon footprint?
2. Which countries does a mango from Brazil pass through before it reaches your plate?
3. What are some local alternatives to rice, quinoa, or cashew nuts?

## EXTENSION ACTIVITIES

1. Exhibition of meals: Display “before and after” versions of meals with their carbon footprints.
2. Family challenge: Students work with their parents to create a more sustainable version of their favorite family recipe and present it in class.

## NOTES FOR TEACHERS

### USEFUL SOURCES AND CALCULATORS:

- *BBC Climate Food Calculator*
- *Environmental Footprints*
- *Carbon footprint*



# Meal with a Footprint

## WORKSHEET

Group members:

Class:

Date:



Name of the dish

Ingredients



Ingredient 2



Estimated CO<sub>2</sub> footprint (per kg):

Local or imported?

Country of origin:

Ingredient 3



Estimated CO<sub>2</sub> footprint:

Local or imported?

Country of origin:

Ingredient 1



Estimated CO<sub>2</sub> footprint:

Local or imported?

Country of origin:

Ingredient 4



Estimated CO<sub>2</sub> footprint:

Local or imported?

Country of origin:

**Total CO<sub>2</sub> footprint** (approximate):

**More sustainable version** (ingredient swaps, new recipe idea, etc.):





# Green Makeover: Design Your Edible Corner

## TEACHER PREPARATION

1. Identify possible areas for transformation (e.g., part of the school garden, an edge of the schoolyard, a green atrium).
2. Prepare materials about edible gardening (books, articles, or verified online sources with examples).
3. Gather pictures of herbs, edible flowers, and fruit bushes (or small seed packets for inspiration).
4. If possible, provide a simple map or plan of the garden or the area to be redesigned.
5. Prepare drawing and digital tools (A3 paper, colored pencils, markers, or access to Canva or SketchUp).

## STEP-BY-STEP GUIDE

1. **Introduction:** Students explore examples of edible garden corners from around the world (via photos, short videos, or online research).
2. **Lead a discussion** about the principles of beautiful + useful + sustainable. Ask: *“What does it mean for something to be both edible and aesthetic?”*
3. **Designing the edible corner:** Each group receives: a map/plan of the area, a list of possible plants, and notes about their growing conditions. Students design their own “green transformation” – an edible and visually appealing corner. They must include: at least 1 fruit plant, 2 herbs, 1 edible flower, and 1 seasonal vegetable. Each plan should also feature short notes on plant care and maintenance.
4. **Culinary creativity:** Each group creates at least one recipe using plants from their design. The recipe should be seasonal, simple, and practical – for example: herbal butter, edible-flower salad, herbal tea blend, cottage cheese spread with herbs, or elderflower syrup. The recipe is presented on a creatively designed poster or recipe card.



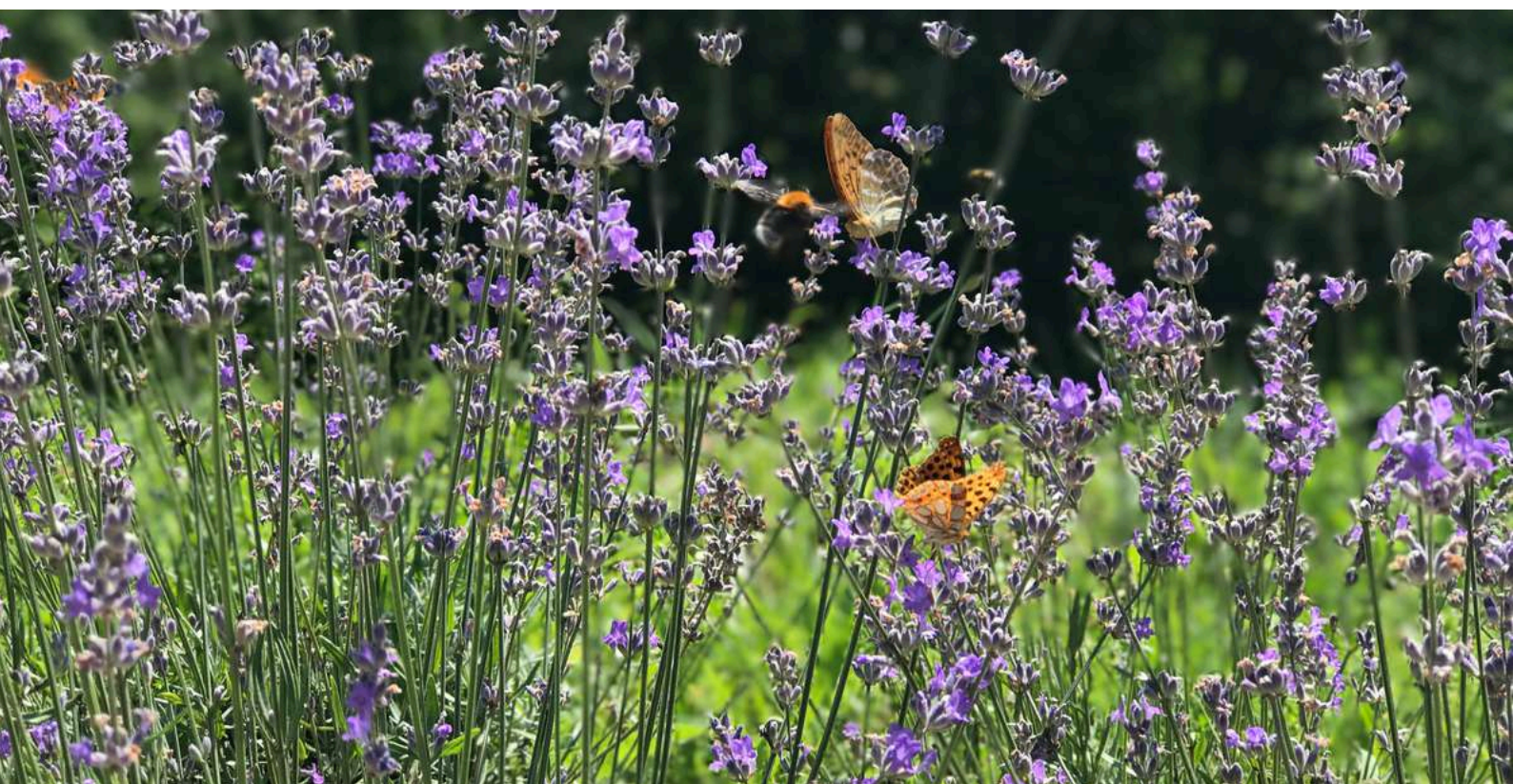
- 5. Presentation and exhibition:** Groups present their projects using a model, drawing, or digital plan, accompanied by recipe. Students vote for the most feasible, most beautiful, or most delicious design. Display the designs and recipes in the school cafeteria or library.

## REFLECTION QUESTIONS

1. Is it more important for something to be beautiful or useful?
2. Which plant do you find beautiful? Why?
3. Which vegetable from the school garden do you like best? Why?

## EXTENSION ACTIVITIES

1. The group with the most feasible design implements their edible corner to life with the support from a gardener, local nursery, or the school kitchen.
2. Herb and Edible-Flower Herbarium: Students collect and preserve selected plants, then laminate them with identification cards (common and scientific names, flowering/harvest season, plant part used, and how it's used). They can also add a QR code linking to the description.
3. Garden Recipe Book: Collect all the students' recipes into a class booklet or digital brochure.



# GREEN MAKEOVER



## RESEARCH SHEET

Group members:

Class:

## NAME YOUR EDIBLE CORNER



List the plants you will include:

1. FRUIT PLANT:
2. HERB 1:
3. HERB 2:
4. EDIBLE FLOWER:
5. VEGETABLE:




Where on the school grounds would you **plant** your corner? **Why?**



**Why** did you choose these **plants**? 

How are they connected to the season and local cuisine?

**Recipe** (name + instructions) 

Write a recipe using the plants from your design.



# Our Food: Idea Carousel for a Better World

## TEACHER PREPARATION

1. Begin by presenting the challenge: “*How can improving our eating habits, awareness, and the school environment contribute to a more sustainable future?*”
2. Prepare materials with examples of good practice (e.g., school gardens, local initiatives, videos about sustainable eating).
3. Gather creative materials (paper, colored pencils, cardboard for models, or digital tools such as PowerPoint, Canva, recording devices, etc.).
4. Divide students into groups of 3–5.

## STEP-BY-STEP GUIDE

1. **Research phase:** Each group explores one challenge related to food or the school garden (e.g., food waste in the cafeteria, an underused garden, monotonous menu, lack of awareness about local food). They can take inspiration from examples such as innovative herb corners, traditional family recipes, or apps for seasonal cooking.
2. **Concept development:** Each group selects one idea and develops it into a mini project. They create a draft of a business or community model that includes: what they want to improve, how their idea will work, who will be involved (school, parents, municipality, etc.), what impact it will have (on the environment, health, well-being, etc.).
3. **Creative output:** Groups prepare one or more outputs, such as: a PowerPoint or Canva presentation, a model of a school garden or new garden corner, a short video or vlog episode, a poster or infographic, a short podcast (e.g., an interview with a grandparent about food then and now), a seasonal menu, or an educational game or a brochure about local food.
4. **Final event – Idea Carousel:** Groups present their solutions to the class or a wider audience (e.g., during an open day or eco day). You can invite guests such as a chef, local producer, or city representative. Conclude with a vote for the most feasible, most creative, or most engaging idea.



## REFLECTION QUESTIONS

1. Which idea would most effectively reduce food waste at school? Why?
2. How would your grandparents approach the issue you researched?
3. How do you think today's school menu differs from the one 100 years ago?

## EXTENSION ACTIVITIES

1. Implementation: The best idea is brought to life with the support of mentors (teachers, parents, or community partners).
2. Exhibition or online sharing: Display all ideas in the classroom, library, or on the school website.



Group name:

Group members:

Class:

Date:



# Our Food: Idea Carousel for a Better World

## RESEARCH SHEET

**What is our challenge?**



**What solution do we propose?**



**Who will benefit from our solution, and how?**



**What knowledge and resources do we need to make it happen?**



**What will we prepare for our presentation?**



**Our title, slogan, or key messages:**

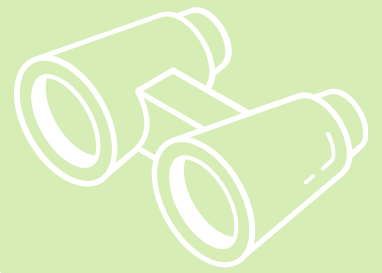


**How can our idea be implemented in real life?**



## Further Exploration

- *Urban school garden, a teacher's guide*
- *Gardening Etiquette*
- *Gardening Journal*
- *Simple Steps to Self-Sufficiency*
- *Food for Life*





## MODULE 2

# *Environment and Biodiversity*

Urban school gardens provide valuable spaces for preserving and promoting biodiversity in cities. They allow students to connect directly with nature and understand the importance of ecosystems, pollinators, soil organisms, and natural cycles. Through hands-on learning, students deepen their awareness of how humans and the environment are interconnected, while while developing a sense of responsibility for the sustainable use of natural resources.

# Keywords

Environmental Studies, Science and Technology, Biology, Home Economics, Visual Arts, Mathematics, Calculation, Drawing, Creativity, Observation, Coloring Sheet, Worksheet, Survey, Picture Cards, Table, Poster, PowerPoint Presentation, Group Work, Insect Hotel, Habitats, Ecosystem, Biodiversity, Pollinators, Food Chain, Life Cycle, Ages 6–8, Ages 9–11, Ages 12–14.

# Guidelines

Through hands-on activities in the school garden, students explore the interconnections between plants, animals, soil organisms, and humans, and learn how fostering biodiversity contributes to a healthy environment.

## 1. Observe and Explore Nature in the Garden

- Encourage students to observe a variety of living organisms—from soil dwellers (earthworms, ants) to pollinators (bees, butterflies).
- Organize activities in which students explore food chains and the role each species plays in the ecosystem.

## 2. Create Habitats in the Garden

- Design animal-friendly spaces in the school garden: insect hotels, birdhouses, nesting boxes and shelters for hedgehogs and lizards.
- Highlight the importance of native plants for pollinators and other species.

## 3. Teach Soil Care and Sustainable Gardening

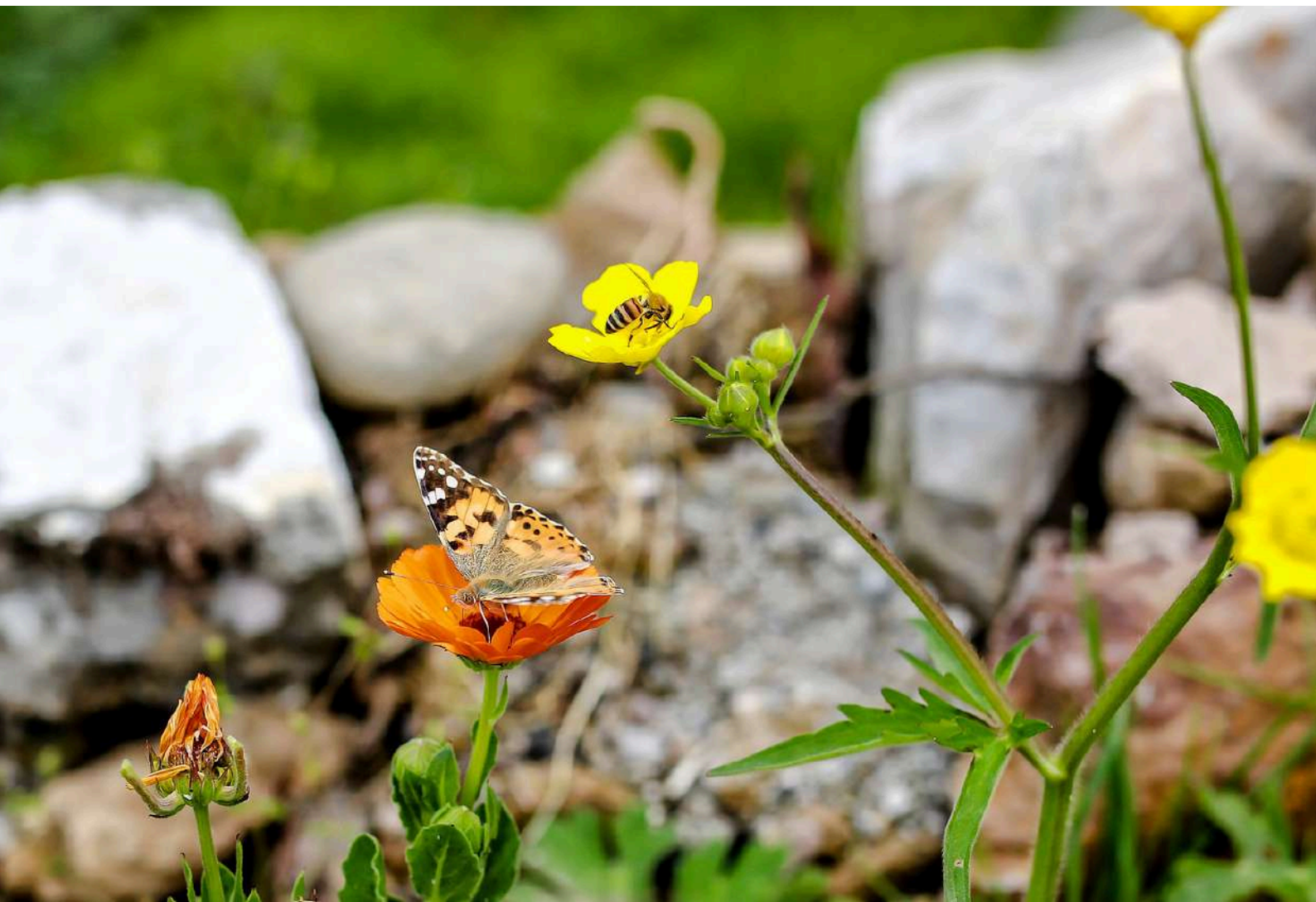
- Explain the role of soil organisms (worms, bacteria, fungi) in healthy plant growth.
- Students can conduct simple experiments such as measuring soil moisture or pH levels.
- Discuss composting and natural fertilization and pest control methods.

## 4. Engage Parents and the Local Community

- Invite local experts (beekeepers, gardeners) to share their knowledge and experience with students.
- Organize a community event dedicated to biodiversity in the school garden.
- Encourage students to create posters or give short presentations about why biodiversity matters in urban environments.

## Objectives

- **Students explore and identify** different species of plants, animals, and microorganisms in the school garden and recognize their roles within the ecosystem.
- **Students observe** relationships between living organisms and their environment and understand the concept of biodiversity.
- **Students actively participate** in activities that promote biodiversity in the school garden (e.g., planting native species, building birdhouses and insect hotels).
- **Students learn about life cycles** of living organisms (e.g., a butterfly, a frog, a tomato) and understand how these cycles maintain balance in nature.
- **Students create and analyze** food chains in the school garden and discuss what happens when one link in the chain disappears.
- **Students develop a responsible attitude** toward nature through the practice of sustainable gardening.
- **Students raise awareness** among peers and the local community about the importance of biodiversity (through posters, presentations, or short video clips).



# Activities



**Ages 6–8**

**Goal:** *Students learn basic biodiversity concepts and develop a sense of connection with nature through play and observation.*

## 1. Find the Animals and Plants

- Students explore the school garden and look for different living organisms – such as insects, birds, and plants (ladybirds, bees, tomatoes, dandelions). For each species they find, they draw a simple picture on A4 or A5 paper. They can draw directly in the garden (next to the plant or animal) or later from memory. In class, they cut out their drawings and create a large collective poster titled Our School Garden. Students may also add labels or short descriptions (if they can write), or draw simple symbols next to each illustration – a heart for “helpful,” a sun for “needs light,” etc.



## 2. My Animal in the School Garden

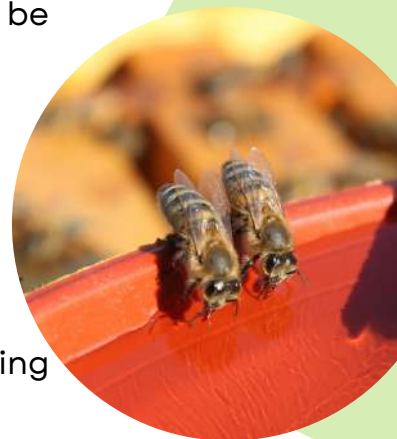
- Students observe animals living in the school garden (snails, bees, worms, ants, etc.). Each student (or group) selects one animal to observe closely, paying attention to its features – number of legs, antennae, wings, shell, how it moves (crawling, flying, sliding, etc.). If they are not writing yet, they can count, compare, and draw instead.
- After the observation, each group (or student) creates a model of their chosen animal using recycled or natural materials (Tetra Pak, bottle caps, cardboard rolls, plastic bottles, etc.). Examples: Bees made from paper rolls and bottle tops, ants made from caps and cotton swabs, snails from clay and real shells, butterflies from plastic bottles and paper plates.
- For extra inspiration, teachers can find craft ideas on *Pinterest*.





### 3. Caring for Pollinators

- Students plant nectar-rich flowers such as marigolds, sunflowers, or lavender that attract pollinators such as bees, bumblebees, and butterflies. Together, they create a dedicated garden bed or a dedicated pollinator area within the school garden.
- They also make simple insect water stations: shallow bowls or trays filled with water and a few large stones that stick out above the surface so insects can land safely without drowning. The bowls should be placed in sunny spots among the plants.
- Additionally, students can leave pieces of fruit (apple or pear slices) in shaded parts of the garden to provide food for butterflies and other insects.



### 4. Thinking Tasks

- Students solve various puzzle-style activities such as counting exercises, word searches, coloring activities, or matching games – all themed around biodiversity. Although these activities do not directly impact the biodiversity of the garden, they help students understand the diversity of living organisms and their importance. Through these playful tasks, students become more aware of different species and develop a stronger connection with nature.





**Ages 9–11**

**Goal:** *Students explore garden ecosystems and understand the interconnections between living organisms.*

## 1. Food Chains in the Garden

- Student groups investigate how different living organisms in the school garden are connected through food chains.
- Each group selects one starting organism (a plant or animal) and creates a food chain with at least three links. For each link, students write its role (e.g., earthworm – decomposer).
- At the end, groups present their food chains and explain the role of each organism. Encourage discussion with a guiding question: “What might happen if one of these plants or animals disappeared?”

## 2. Observing Garden Animals

- Students observe bees, birds, and other animals in the school garden. They note which plants the animals visit most often and where they tend to stay. They can make drawings, short notes, or take photos to document their findings.



## 3. Insect Hotel

- Students build an insect hotel using natural and recycled materials, such as straw, hay, pinecones, sticks, wood, bark, sand, stones, cans, bottles, Tetra Pak cartons, clay pots, or wooden pallets.
- Divide the class into groups – each group designs one section of the hotel (for example, a room for solitary bees or a shelter for beetles).
- Instructions and inspiration can also be found in the guide [Urban School Garden](#).

## 4. Poster or Presentation: Plants and Animals in Our School Garden

- Students work individually or in groups to create a poster or PowerPoint presentation about the plants and animals living in the school garden. The presentation should include: the name of the plant and/or animal, a short description, its role in the garden ecosystem, interesting facts.
- Alternatively, each student can prepare A5 page about a chosen organism. All pages can then be combined into a collective class poster titled *Organisms in Our School Garden*.



**Ages 12–14**

**Goal:** *Students think critically about the human impact on biodiversity and propose solutions for its preservation.*

## 1. Which Animals Live in Our Garden?

- Students work individually or in groups to conduct a species survey of the school garden. They record all observed animals, classify them into major animal groups (e.g., insects, arachnids, birds, mammals), and research their role in the garden ecosystem.
- Once they have identified each species' role, students create a visual model of the garden ecosystem – a poster or infographic showing the interconnections between species and their importance.
- Encourage discussion with the question: “*What might happen if one of these species disappeared?*”



## 2. Habitats for Animals

- Students build wildlife shelters using natural and recycled materials – insect hotels, hedgehog houses, bat boxes, lizard shelters, or frog ponds. They learn how such small interventions can support local biodiversity and help maintain ecosystem balance. (Instructions and examples can also be found in the guide [\*Urban School Garden\*](#).)

## 3. Welcome, Pollinators!

- Students analyze how many different pollinator species (e.g., bees, butterflies, bumblebees, hoverflies) they can find in the school garden. They then propose and design strategies to attract more – such as planting nectar-rich flowers, reducing pesticide use, or creating pollinator-friendly zones. They create posters, flyers, or short video campaigns that raise awareness about the importance of pollinators and promote actions to help them in gardens and cities.



## 4. Life Cycles of Plants and Animals

- Students research the life cycles of selected plants and animals from the school garden. They observe growth and developmental stages, take measurements, and document changes over time. Each group presents a life cycle of one species, and their findings are compiled into a collective class poster showing the interdependence of life forms in the garden ecosystem.

# Module 2: Environment and Biodiversity – LEARNING EXPERIENCES

## Ages 6–8



### **Biodiversity Thinking Tasks**

- Counting and basic maths
- Letter grid and word search puzzle
- Coloring activity

## Ages 9–11



### **Animals in Our School Garden**

- Worksheet
- Observation
- Pair and group work

## Ages 9–14



### **Food Chains in the School Garden**

- Animal and plant cards
- Producer – Consumer – Decomposer classification
- Group activity

### **Creating Habitats for Garden Animals**

- Group activity
- Beneficial species
- Building instructions for animal shelters

## Ages 12–14



### **Animal Survey in the School Garden**

- Worksheet
- Interconnectedness of living organisms
- Poster or infographic creation





# Biodiversity Thinking Tasks

## TEACHER PREPARATION

1. Prepare a set of tasks that help students explore biodiversity in the school garden.

You can use the following examples:

- Count and Calculate: identifying and counting animals and plants, solving simple maths problems.
  - Find the Words: searching for biodiversity-related terms in a word-search puzzle.
  - Name and Color: identifying, naming, and coloring plants and animals.
2. Make sure the tasks are age-appropriate and diverse enough to encourage observation, logical thinking, creativity, and basic math skills.
  3. You can organize the activities as individual work, pair work, or learning stations where students rotate between different tasks.

## STEP-BY-STEP GUIDE

1. Divide students into small groups, pairs, or allow them to work individually. Explain the purpose of the tasks and the instructions for each one.
2. Students complete the tasks – assist them as needed.
3. When all tasks are completed, discuss together what new terms students have learned, and why biodiversity is important for a healthy garden ecosystem.
4. For the *Find the Words* activity, take students outside to the school garden after completing the the word search. Ask them to locate and observe the plants and animals they found in the puzzle, and discuss their characteristics and roles.
5. For the *Name and Color* activity, students name the organisms and color them – use colored pencils or natural pigments (e.g., dandelion petals for yellow).



## REFLECTION QUESTIONS

1. Why is it important for different species to coexist in the garden?
2. What would happen if only one type of plant or animal lived there?
3. How can people help protect and promote biodiversity?

## EXTENSION ACTIVITIES

1. After completing the tasks, students create a collaborative poster that lists the plants and animals they would like to see in the school garden, along with suggestions for how to attract those species.
2. You can also organize a garden walk, where students record all the species they observe in a simple “*Biodiversity Journal*” – including drawings, photographs, and short descriptions.

## NOTES FOR TEACHERS

Students can complete these tasks directly in the school garden, so they can immediately look for real-life examples. This hands-on approach boosts engagement and motivation and strengthens the connection between classroom learning and nature.



NAME:

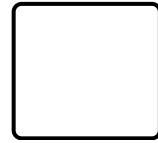
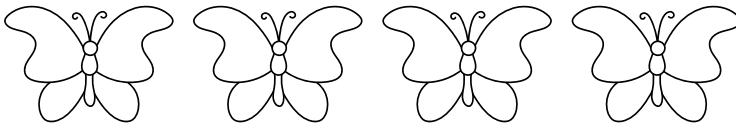
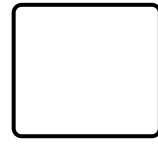
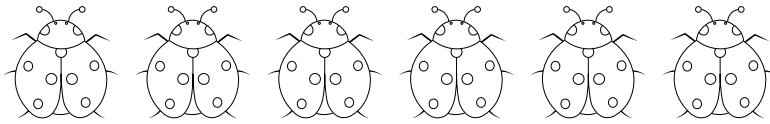
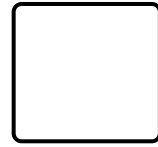
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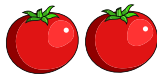
# COUNT AND CALCULATE

**COUNT THE ANIMALS YOU CAN FIND IN THE SCHOOL GARDEN.  
DO YOU KNOW THEM? COLOR THEM IN!**





**WRITE A MATHS PROBLEM, SOLVE IT, AND NAME THE VEGETABLE.**

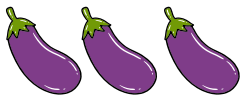
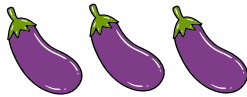


 -  = 5 - 2 = 3

TOMATO

 +  =

 +  =

 +  =

 -  =

NAME:

CLASS:

DATE:



# FIND THE WORDS



FIND 10 WORDS RELATED TO BIODIVERSITY IN THE SCHOOL GARDEN.

WORDS YOU FOUND: \_\_\_\_\_

G	T	B	E	E	T	S	T
A	M	C	N	H	O	N	N
R	R	O	S	T	M	A	I
D	G	U	L	C	A	I	M
E	B	K	G	E	T	L	A
N	S	E	E	D	O	E	N
B	L	O	S	S	O	M	T

GO TO YOUR SCHOOL GARDEN AND FIND THE PLANTS AND ANIMALS YOU HAVE DISCOVERED IN THE GRID. CAN YOU FIND THEM ALL?

ANSWERS: BEE, GARDEN, TOMATO, BLOSSOM, SEED, ANT, SNAIL, BUSH, MINT, MOLE

NAME:

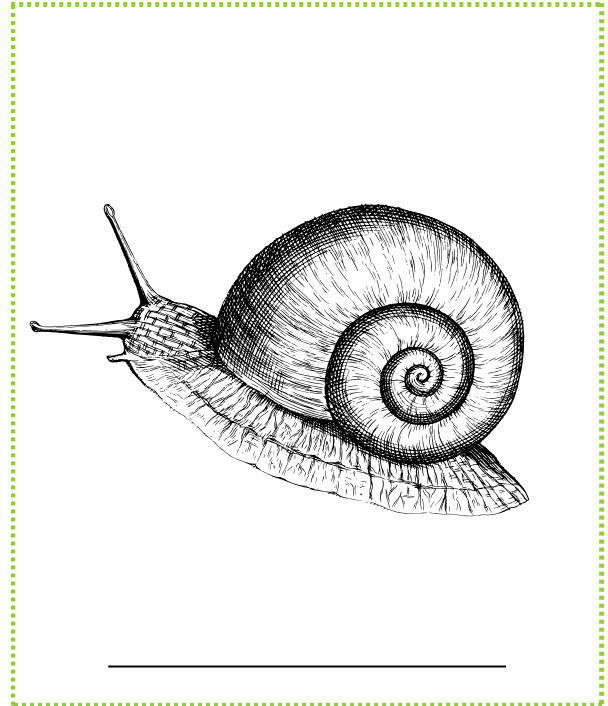
CLASS:

DATE:



# NAME AND COLOR

**NAME THE ANIMALS AND PLANTS IN THE PICTURES AND COLOR THEM IN.**





# Animals in Our School Garden

## TEACHER PREPARATION

1. Print the worksheets with pictures of animals that students might encounter in the school garden.
2. Optionally, include images of less visible or locally native species to raise awareness about their importance.
3. Provide observation tools (magnifying glass, binoculars, notebook, pencil).
4. Before going outside, explain the rules for safe and respectful animal observation.

## STEP-BY-STEP GUIDE

1. Divide students into pairs or small groups and hand out the worksheets.
2. Groups explore the school garden and look for animals that match the pictures on their sheets.
3. When they find an animal, they write its name in the blank space below the image.
4. If they spot an animal not shown on the sheet, they can draw or photograph it and add its name.
5. Afterward, return to the classroom and review the animals you found together. Sort them by their roles in the garden (pollinators, decomposers, natural pest control).





## REFLECTION QUESTIONS

1. Which animal did you see for the first time today?
2. Why are some animals more hidden or harder to find?
3. How do the animals you observed support the garden?
4. What might happen if there were no animals in the garden?

## EXTENSION ACTIVITIES

1. Students create a poster or presentation about the animals in the school garden, including drawings, photos, and short descriptions.
2. Add garden features that attract wildlife (insect hotel, bird feeder, flowering plants).
3. Using their collected data, students create a “*School Garden Animals Calendar*.” This can be designed as a poster, digital presentation (e.g., Canva, PowerPoint), or an illustrated booklet with names and descriptions of the animals.

## NOTES FOR TEACHERS

Repeat this activity across all four seasons. Observe and record which animals appear in autumn, winter, spring, and summer. At the end of each season, review and compare the class’s observations: Which species were present year-round? Which only in certain seasons? Why do you think that is?



Name: \_\_\_\_\_

Class: \_\_\_\_\_

Date: \_\_\_\_\_



# Animals in Our School Garden

Find the animals in the pictures in your school garden. When you **spot** one, **tick it** and **write down** its name.









bee





Find the animals in the pictures in your school garden. When you spot one, tick it and write down its name.



 <input type="checkbox"/> <input type="text"/>	 <input type="checkbox"/> <input type="text"/>	 <input type="checkbox"/> <input type="text"/>
 <input type="checkbox"/> <input type="text"/>	 <input type="checkbox"/> <input type="text"/>	 <input type="checkbox"/> <input type="text"/>
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Find the animals in the pictures in your school garden. When you spot one, tick it and write down its name.






Draw and label any additional animals you discovered in the school garden.



# Food Chains in the School Garden

## TEACHER PREPARATION

1. Prepare a set of picture cards showing animals and plants commonly found in the school garden (e.g., ladybug, snail, blackbird, bee, strawberry, lettuce, earthworm), or use the template below. Include arrows or ribbons for connecting the steps in the chain, or simply provide materials (colored paper, scissors, crayons/markers) so students can create their own food chains.
2. On the back of each card, write basic information about the organism and its role in the food chain (producer, consumer, decomposer).
3. Prepare a workspace (classroom, teachers' lounge, or outdoors in the garden) where groups can spread out and assemble their food chains.

## STEP-BY-STEP GUIDE

1. Divide students into small groups and explain the concept of a food chain and the roles of its members (producers → consumers → decomposers).
2. Tell students that a food chain is a linear sequence of organisms linked through feeding relationships. The chain always begins with producers (plants that create food through photosynthesis), followed by consumers (animals that eat plants or other animals – herbivores, carnivores, or omnivores). Finally, decomposers feed on dead organisms and organic waste, breaking them down into nutrients that enrich the soil. This process closes the nutrient cycle and keeps the ecosystem balanced.
3. Each group selects one starting plant or animal and builds a food chain using the picture cards, including at least three links.
4. For every link, students label its role (e.g., lettuce – producer, snail – consumer (herbivore), hedgehog – consumer (omnivore)).
5. When finished, groups present their food chains. Encourage discussion with the question: “*What would happen if one of the species disappeared from the chain?*”



## REFLECTION QUESTIONS

1. What ties together all parts of a food chain?
2. Why are decomposers essential for nature?
3. Can one species be part of more than one food chain?
4. How would the disappearance of one link affect the others?

## EXTENSION ACTIVITIES

1. Students can connect several food chains into a food web that represents the garden ecosystem.
2. Conduct the activity outdoors – let students observe the actual organisms that are part of their chains.
3. As an extra task, ask students to add another link (e.g., a decomposer) to their food chain. They can draw it themselves or find a picture online.



# Food Chains in the School Garden



Using the picture cards, **create as many food chains as possible** from the living organisms found in an urban school garden.



**EARTHWORM**



**BLACKBIRD**



**FLOWER**



**LEAF**



**STEM**



**ROOTS**



**HEDGEHOG**



**LETTUCE**



**SNAIL**



**STRAWBERRY**



**GREAT TIT**



**SEED**



**APHID**



**BEE**



**SNAKE**



**LADYBUG**



**MOUSE**



**FROG**



**CARROT**



**FOX**



**VOLE**



# Creating Habitats for Garden Animals

## TEACHER PREPARATION

1. Begin with a class discussion: “*Why are animals important for our school garden? Which animals visit it? Could we attract even more and how?*”
2. Briefly explain the role of different species in the garden: bees – pollinators, hedgehogs – natural predators of slugs and snails, bats – help reduce mosquito populations, lizards – control insect numbers.
3. Together, explore how to make the garden more animal-friendly by providing: food (flowers, herbs), shelter (dense vegetation, bushes, stones), water (small bowls or ponds), quiet areas (undisturbed corners for nesting and rest).
4. Show examples of animal shelters: insect hotels, hedgehog houses, bird nest boxes, lizard shelters made of stones, and bat boxes.
5. Display photos or illustrations for inspiration. Instructions and inspiration can be found in the guide [\*Urban School Garden\*](#), on Pinterest, YouTube ...
6. Gather natural and recycled materials such as wood, twigs, pallets, bricks, clay pots, stones, bamboo canes, dry grass, and pinecones.

## STEP-BY-STEP GUIDE

1. Divide students into groups. Each group chooses one animal species to build a shelter for.
2. Groups plan what they need (materials, tools) and draw a simple design.
3. Using natural and recycled materials, they build their chosen habitat (e.g., an insect hotel from wooden frames and bamboo canes; a hedgehog house from boards and dry grass; a lizard shelter made of stacked stones).
4. Students place the shelters in suitable garden locations – insect hotels in sunny spots, hedgehog shelters in quiet, shaded corners, etc.
5. Each group presents its creation, explains which animal it is for, and describes how it will support the garden ecosystem.



## REFLECTION QUESTIONS

1. Which animals are most beneficial for our garden and why?
2. How can we attract animals without disturbing them?
3. Why is it important for a garden to have a variety of habitats?
4. What would happen to the garden if certain helpful animals (such as bees, birds, or hedgehogs) disappeared?

## EXTENSION ACTIVITIES

1. Students keep a Habitat Logbook to record which animals use the shelters.
2. Organize guided tours of the habitats for other classes or parents.
3. Add small information labels next to the shelters, showing the animal's name, photo, and its importance for the garden.

## NOTES FOR TEACHERS

Before starting, remind students to handle tools and materials safely. Encourage teamwork and sharing roles. Ensure that the habitats are placed where they won't interfere with regular garden activities.





# Ideas and Guidelines for Making Animal Habitats

## ORANGE-PEEL BIRD FEEDER

### MATERIALS NEEDED:

1. Orange peel halves (scooped out)
2. Strong string or natural twine
3. Wooden stick (e.g., a skewer or a chopstick)
4. Bird feed (mixed seeds, sunflower seeds, finely chopped apples, unsalted nuts)



### INSTRUCTIONS:

1. Cut the orange in half and carefully scoop out the fruit, leaving the peel intact.
2. On two opposite sides of the peel, make small holes and thread a piece of string through them to create a hanger.
3. Strengthen the bottom by inserting a wooden stick across the opening – it will act as a perch for birds to land on.
4. Fill the peel with bird food.
5. Hang the feeder on a tree in a quiet, safe location, high enough to keep it out of the reach of potential predators.





## LIZARD SHELTER

### MATERIALS NEEDED:

1. Stones of various sizes
2. Bricks
3. Clay pots (broken ones work well too)
4. Coarse sand or gravel
5. Pieces of wood or bark

### INSTRUCTIONS:

1. Choose a sunny spot in the garden, sheltered from strong winds.
2. Spread a layer of sand or gravel on the ground to ensure good drainage.
3. Stack stones, bricks, and clay pots to create small gaps and crevices where lizards can hide and rest.
4. Place a few flat stones on top – these will serve as warm basking areas for the lizards.
5. Plant low-growing plants or grasses around the edges of the shelter to provide additional cover and natural integration into the garden.
6. You can find visual inspiration in the video *How to build a lizard lounge*.





## BAT HOUSE

### MATERIALS NEEDED:

1. Untreated wooden boards (at least 2 cm thick; rough-sawn is ideal)
2. Nails or screws
3. Waterproof wood glue
4. Tools: a saw, a drill, a screwdriver, and a tape measure



### INSTRUCTIONS:

1. Cut the following pieces: back panel: approx. 60 × 35–40 cm, two side panels: 60 × 10–12 cm, front panel: approx. 55 × 35–40 cm, roof: same width as the back panel, about 12–15 cm long.
2. Leave the inside surface of the back panel rough or add thin horizontal slats or shallow grooves to give bats something to grip.
3. Attach the side panels to the back using screws or nails. Then attach the roof on top so that it extends 2–3 cm beyond the front edge for rain protection.
4. Attach the front panel, leaving a narrow entrance gap (about 1.5–2 cm) at the bottom. For extra durability, seal the joints with waterproof wood glue.
5. Mount the bat house 3–4 meters above the ground on a tree, pole, or wall, with the entrance facing south-east or south, away from bright artificial lights and obstructions such as overhanging branches or leaves.
6. You can find more design ideas and visual inspiration on *Pinterest*.





## HEDGEHOG HOUSE

### MATERIALS NEEDED:

1. Wooden boards (at least 2 cm thick)
2. Nails or screws
3. Predator-proof mesh (optional)
4. Dry grass or leaves for the interior
5. Tools: a saw, a hammer, and a screwdriver



### INSTRUCTIONS:

1. Build a simple wooden box measuring approximately 30 × 40 cm and about 20 cm high.
2. Create an entrance tunnel about 20–30 cm long and 10 cm wide; this helps keep predators out.
3. Fill the inside of the box with dry grass or leaves to make a warm, comfortable nesting space.
4. Slightly tilt the roof to allow rainwater to drain away.
5. Place the hedgehog house in a quiet, sheltered corner of the garden, protected from wind and direct sunlight. For extra camouflage, cover it partly with leaves or branches.
6. You can find more creative ideas and simple building plans on *Pinterest*.





# Animal Survey in the School Garden

## TEACHER PREPARATION

1. Prepare a worksheet with a table of three columns: Animal Name, Animal Class, and Role in the Garden.
2. If needed, provide illustrated materials to help students identify different species.
3. Before going outside, explain the main animal classes (e.g., mammals, birds, reptiles, amphibians, insects) and possible roles in the garden (pollinators, decomposers, natural pest controllers, herbivores).
4. If available, prepare observation tools such as magnifying glasses, binoculars, or simple photo equipment (a phone or tablet) for documenting sightings.

## STEP-BY-STEP GUIDE

1. Divide students into small groups, pairs, or let them work individually.
2. Send them to the school garden to record all observed animals. For each species, they fill in the table with its name, class, and ecological role.
3. If they are unsure of the name, they can draw, describe, or photograph the animal and identify it later together with the teacher.
4. After completing the survey, students analyze the data and determine each species' role in the garden ecosystem.
5. On a poster or infographic, groups create a simple model of the garden ecosystem, using arrows to show the relationships between species (e.g., plant → insect → bird → decomposer).
6. Lead a discussion:
  - “Which animals were most common in the garden?”
  - “Why do you think so?”
  - “What could we do to attract even more animals to the garden?”



## REFLECTION QUESTIONS

1. Which animal surprised you most today, and why?
2. Does every animal in the garden have an important role? Why or why not?
3. How can we ensure that the garden supports a diverse range of animals?

## EXTENSION ACTIVITIES

1. Students can use the collected data to create an annual overview of garden animals, tracking changes in abundance and species diversity throughout the year.
2. Link this activity to food chain exploration or biodiversity monitoring.
3. Encourage students to enhance the garden's biodiversity by adding elements such as an insect hotel, a bird feeder, or flowering plants.



# Animals in the School Garden

## SURVEY SHEET

NAME/PAIR/GROUP:

CLASS:

DATE:



Find as many animals as you can in the school garden and record them in the table below.

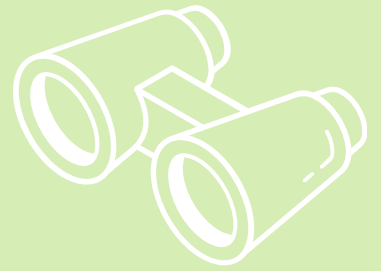


ANIMAL NAME	ANIMAL CLASS	ROLE IN THE GARDEN
bee	insect	pollinator; helps promote biodiversity in the garden



## Further Exploration

- **Urban school garden, a teacher's guide**
- ***Gardening Etiquette***
- ***Gardening Journal***
- ***Biodiversity in schools***
- *A guide to increasing biodiversity in your schools*
- *Teaching tools about biodiversity*



A white bucket is tilted, pouring a mix of vegetable scraps like green beans, carrots, and leafy greens into a wooden garden bed. The garden bed is filled with dark soil and other food waste, including a slice of orange, a strawberry, and various vegetable peels. The background shows a grassy area.

### MODULE 3

## ***Waste Reduction and Circular Economy***

Waste reduction and the circular economy are key components of sustainable development. Students can explore these concepts through hands-on work in the school garden. Activities such as composting, using recycled materials, and understanding the life cycle of products help students develop ecological literacy and a responsible attitude towards the environment.

# Keywords

Environmental Studies, Science and Technology, Science, Biology, Home Economics, Visual Arts, Mathematics, Recycling, Upcycling, Workshops, Compost Bin, Insect Hotel, Planter, Treasure Hunt, Waste Sorting, Worksheet, Chart, Poster, Action Plan, Resource, Raw Material, Recycling Center, Group Work, Ages 6–8, Ages 9–11, Ages 12–14.

# Guidelines

School gardens provide an ideal environment for learning about the circular economy and responsible resource management. Students learn that waste can often become a valuable resource that can be reintroduced into the life cycle. Through composting, recycling materials, and creative reuse, the urban school garden becomes a hands-on classroom for understanding circular processes in nature and society.

## REDUCE – REUSE – RECYCLE

### 1. Explore the origins of materials in the garden

- Together with students, examine what materials are used for gardening tools and equipment (e.g., plastic pots, fertilizer, twine).
- Encourage students to think about more sustainable alternatives for these materials.

### 2. Natural cycles as inspiration

- Connect material flows in nature (e.g., decomposition of plants in compost) with the concept of a circular economy.
- Create a compost bin together (instructions available in the [\*Urban School Garden, a Teacher's Guide\*](#)).

### 3. Apply the 3R principle – Reduce, Reuse, Recycle

- Teach students how to separate waste and encourage them to think about ways to reduce waste in the school garden (e.g., collecting rainwater, making garden markers).
- Organize creative workshops using waste materials (e.g., making plant labels, flower pots, recycled edging for garden beds, or insect hotels).

### 4. Encourage problem-solving and innovation

- Invite students to propose their own innovative circular solutions for the school garden (e.g., seed swaps, using eggshells for planting).
- Explore how the school could collaborate with the local community (e.g., care homes, nearby farms).

## Objectives

- **Students explore and identify** materials used in the school garden, their sources, and their environmental impact (e.g., plastic pots, metal tools, wooden raised beds).
- **Students sort waste correctly** generated during gardening activities (e.g., organic waste, plastic bottles, fertilizer packaging) and take responsibility for recycling and composting.
- **Students find opportunities for reuse and upcycling** of materials in the garden (e.g., making planters from waste packaging, creating plant labels from wood).
- **Students apply circular approaches** in the school garden, such as composting organic waste, collecting rainwater, and using recycled materials.
- **Students recognize the life cycle** of garden products and suggest ways to extend it (repair, reuse, sharing).
- **Students research examples of circular economy** practices related to gardening and urban food production (e.g., local gardeners, community gardens, sustainable gardening materials).
- **Students plan and implement waste reduction activities** in the garden and at school (e.g., paper or bottle collection campaigns, seed and seedling exchange initiatives).
- **Students connect the theory** of the circular economy with hands-on experience in the garden and apply these principles in everyday life at home.



# Activities



**Ages 6–8**

**Goal:** *Through play and creative activities, students learn the basics of waste separation and reuse.*

## 1. Sorting Waste in the Garden

- Students set up recycling bins in or near the school garden and learn what belongs in each category (organic waste, plastic, paper).
- They can make the bins from reused materials such as plastic buckets, wooden boxes, or metal containers, decorate them with colors, and label them with pictures.
- Organic waste can be used for composting.
- Encourage discussion with questions such as: “What can we do to produce less waste in our school garden?” (e.g., using reusable bags, sharing tools).



## 2. Insect Hotel from Natural and Recycled Materials

- Using leftover natural materials (twigs, pinecones) and recycled packaging (toilet paper rolls), students build a simple insect hotel. Detailed instructions for building insect hotels can be found in the *Urban School Garden, a teacher’s guide*.



## 3. Bottle Planters

- Students reuse plastic bottles or milk cartons to create mini planters, planting strawberries, sunflowers, or herbs inside.

## 4. Reuse It!

- Each student brings one item from home that would normally be thrown away (e.g., an egg carton, milk carton, plastic bottle, glass jar). Together, students brainstorm ways to reuse these items in the school garden; for example, as seedling containers, plant markers, or tools in a Treasure Hunt activity.





**Ages 9–11**

**Goal:** Students explore materials and circular processes while actively participating in waste reduction.

## 1. Exploring Materials in the Garden

- Students analyze the materials used for gardening tools and packaging (e.g., plastic pots, metal trowels). Discuss the origin and purpose of each item, and have students complete a chart (available in the learning materials) to reflect on how these materials impact the environment.

## 2. Composting

- Students work together to build or maintain the school compost bin and monitor the decomposition process of organic waste (they can keep observation notes or drawings). Detailed composting instructions can be found in the *Urban School Garden, a teacher's guide* (chapter *Compost*).

## 3. Garden Workshops

- Students organize workshops for younger classmates. Younger pupils, guided by older ones, can make plant markers from cardboard or natural materials, create insect hotel labels showing which animal each “room” belongs to, plant herbs or flowers. Older students can also prepare a Treasure Hunt with garden-related tasks (e.g., “Find a bee,” “Count the zucchinis,” “Identify this herb”). Winners can be rewarded with a small garden treat, such as strawberries.
- Several example activities are provided in the learning materials.



## 4. Upcycling: Turning Waste into Usefulness

- Students create useful garden items from discarded materials. They collect waste items (from home or school), sort them into groups; wooden, plastic, metal, glass, and textile; and brainstorm new uses for them.
- Examples: watering cans from plastic bottles, simple garden furniture (bench, table, stool) from pallets, aprons from old clothes, herb pots from tin cans.

## 5. Visit to a Recycling Center

- If possible, arrange a visit to a local recycling center or invite a representative from a waste management company to speak at school.
- Students learn firsthand how waste is collected and sorted, why recycling matters, and how to reduce waste generation. After the visit, they create an informative poster summarizing key takeaways about waste management.





**Ages 12–14**

**Goal:** *Students think critically about the life cycle of products and design circular solutions for the school garden.*

## 1. The Life Cycle of Products

- Students analyze the life cycle of an item used in the garden (e.g., watering bottle, soil bag) and suggest ways to extend its lifespan. Using the worksheet provided in the learning materials, they reflect on how the product’s production, use, and disposal affect the environment.



## 2. Circular Design Challenge

- Students plan and create an innovative product for the school garden based on the 9R concept (Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle). They first learn the meaning of each “R” and translate them into their language. Then, working in groups, they brainstorm ideas for upcycling or creating something useful for the garden, gather materials, and build the final product; examples include: insect hotels or compost bins made from pallets, watering cans made from plastic bottles, raised beds from old wooden planks. Afterwards, they present how their creation supports circular economy principles.

## 3. Circular Action Plan for the School Garden

- Working in groups, students (optionally using the worksheet provided) design an action plan to reduce waste in the school and garden. They identify key areas of improvement, involve teachers, parents, and the local community, and develop practical steps for change.



## 4. Upcycling Workshop: Useful from Waste

- Students explore the importance of reuse and textile waste reduction. They bring old fabric (T-shirts, sheets, curtains, towels) from home and transform it into useful garden items; such as herb bags, seedling shades, or cleaning cloths.

# Module 3: Waste Reduction and Circular Economy – LEARNING EXPERIENCES

## Ages 6–8

### Mini Planters

- Plastic bottles or milk cartons
- Decorating planters
- Sowing seeds



## Ages 6–11

### Treasure Hunt

- Group work
- Creative stations – drawing, painting, crafting
- A token prize



## Ages 9–11

### Waste Sorting

- Group work
- Chart or sorting table
- Waste classification



## Ages 9–14

### Circularity in the School Garden

- List of garden tools
- Raw materials and their sources
- Decomposition



### Poster for the Classroom or Garden

- Group work
- “Reduce, Reuse, Recycle” theme
- Examples of good practice in the school garden

## Ages 12–14

### Circular Action Plan for the School Garden

- Group work
- Worksheet
- Action plan development





# Mini Planters

## TEACHER PREPARATION

1. Collect enough empty plastic bottles (0.5 litre or 1.5 litre) or milk/juice cartons (Tetra Pak cartons). Ask students a few days in advance to bring their own empty containers from home (one or more).
2. Prepare scissors, markers, tempera paints, brushes, tape, stickers, soil, and seeds (e.g., sunflower, mint, chives, peas).
3. Create a few sample planters to show students what the finished product might look like.
4. Discuss with the class why plastic is an environmental challenge and how we can reuse it in creative ways.

## STEP-BY-STEP GUIDE

1. **Introduction and Discussion:** Talk about why it's important to reuse materials instead of throwing them away. Ask: *“What usually happens to plastic bottles when we throw them away? What about milk cartons?”*
2. **Planning:** Each student chooses whether to use a bottle or a carton and sketches a design for their planter.
3. **Making the Planters:**
  - Cut the containers (horizontally or vertically, depending on the shape).
  - Help younger students if needed.
  - Decorate with paints, stickers, or handmade ornaments.
  - Make small holes at the bottom for drainage.
  - Add soil and plant the chosen seeds.
4. **Setting Up:** Arrange the planters on a window sill, garden space, or classroom corner with enough light. Each planter should have a label with the name of the plant and the student's name.





## REFLECTION QUESTIONS

1. How long would a plastic bottle last in nature if we didn't reuse it?
2. Why is it important not to throw away bottles after one use?
3. Can you think of other ways to reuse bottles or cartons?

## EXTENSION ACTIVITIES

1. Students observe and record the growth of their plants in illustrated journals.
2. Organize an exhibition of the planters, showing the materials used, the types of plants, and the makers' names.
3. Encourage students to share the idea at home; they can make a planter with their families and grow herbs together.





# Treasure Hunt

## TEACHER PREPARATION

1. Divide students into two age groups: older students act as guides, while younger ones are participants. If that's not possible, divide one class into two mixed groups.
2. Together with the guides, plan creative workshops for the younger students; for example: making plant labels, drawing signs for the insect hotel, planting herbs in small pots.
3. Ask the older students to create a Treasure Hunt; simple clues and short challenges related to the school garden. You can use or adapt the *Treasure Hunt template* provided below.
4. Prepare small token prizes (e.g., strawberries from the garden, fruit salad).

Materials needed: cardboard, markers, colored pencils, wooden sticks, soil,

5. seeds, seedlings, etc.

## STEP-BY-STEP GUIDE

1. **Introduction:** Divide the class into groups. Each group of older students leads one of the creative workshops for the younger participants.
2. **Creative Stations:** At each station, younger students complete a small task, such as making plant labels (from cardboard, wood, or recycled materials), drawing insects for the insect hotel, or planting herbs in small pots.

**Treasure Hunt:** The younger students follow clues and complete garden-

3. related challenges with help from their older guides – for example:  
“Find a bee on a flower, Count how many zucchinis are growing in the raised garden bed, smell and name a herb, find the insect hotel and name three animals that live there.

**Closing:** Groups that successfully complete all the

4. challenges receive a small reward, such as fruit or a garden treat.





## REFLECTION QUESTIONS

1. How did I feel as a guide?
2. What did I learn from the younger students?
3. Which activities did they enjoy most?
4. How did we work together to take care of the school garden?
5. What could we improve next time to make the Treasure Hunt even better?

## EXTENSION ACTIVITIES

1. Create a photo or art exhibition in the school showing the workshops, garden discoveries, and student-made items.
2. Repeat the activity with reversed roles; this time, younger students become guides, leading parents, peers, or older students around the garden.
3. Consider organizing the Treasure Hunt at a local educational urban farm or community garden.

## NOTES FOR TEACHERS

### THE TREASURE HUNT TEMPLATE

The Treasure Hunt Template consists of three parts:

- A main activity sheet for each student or group; this serves as a progress tracker where participants stick images as they complete each task.
- A set of task images, each corresponding to one garden station or challenge. After completing a task, the guide gives the student a sticker or cut-out image to attach to the sheet.
- A detailed instruction page for guides, explaining each challenge. These instructions can be attached to the back of each image or displayed at the respective garden stations.

The Treasure Hunt ends when every participant or group has filled in their main activity sheet.



# TREASURE HUNT



NAME/GROUP:

CLASS:

DATE:

**VISIT** EACH STATION, **COMPLETE** THE TASK OR CHALLENGE, AND **COLLECT** ALL 9 PICTURE CARDS. **PASTE** THEM IN THE SPACES BELOW AS YOU GO!



FIND A BEE

COUNT THE  
ZUCCHINIS

IDENTIFY THE  
HERB

WHO LIVES IN  
THE INSECT  
HOTEL

WHERE IS THE  
MINT

FIND THE  
BIGGEST LEAF

POLLINATORS

TODAY'S  
WEATHER

GARDEN  
TOOLS



# TREASURE HUNT



## PICTURE CARDS

**CUT OUT** THE PICTURE CARDS.  
EACH **PICTURE** REPRESENTS A **CHALLENGE** THAT HAS  
BEEN **COMPLETED SUCCESSFULLY**.





# TREASURE HUNT



## DETAILED INSTRUCTIONS

EACH INSTRUCTION CORRESPONDS TO ONE GARDEN STATION.  
GUIDES GIVE THE INSTRUCTIONS TO YOUNGER STUDENTS AT EACH STOP.

OBSERVE THE FLOWERING PLANTS IN THE GARDEN. CAN YOU FIND A BEE?

HOW MANY ZUCCHINIS CAN YOU FIND IN THE GARDEN?  
WHAT STAGE OF GROWTH ARE THEY AT?

SMELL A LEAF AND GUESS WHICH HERB IT IS.

NAME AT LEAST THREE ANIMALS THAT LIVE IN THE INSECT HOTEL. IF YOUR GARDEN HAS ONE, GO AND HAVE A LOOK!

FIND THE HERB CHOSEN BY YOUR GUIDE. SMELL IT CAREFULLY – CAN YOU NAME IT?

LOOK AROUND THE GARDEN. WHICH PLANT HAS THE LARGEST LEAF?

NAME THREE POLLINATORS. CAN YOU SPOT ANY OF THEM IN THE GARDEN?

OBSERVE THE SKY AND DESCRIBE TODAY'S WEATHER CONDITIONS.

NAME FIVE GARDEN TOOLS YOU HAVE IN YOUR SCHOOL GARDEN.



# Waste Sorting

## TEACHER PREPARATION

1. Print a sorting chart for each student.
2. Bring real waste items or show pictures of items that can be found in the school garden or kitchen.
3. Prepare bins or boxes that students can use to simulate sorting.
4. Read the chapter on composting in *Urban School Garden, a teacher's guide* and share your knowledge with students.

## STEP-BY-STEP GUIDE

1. Students mark which bin each type of waste goes in.
2. They note whether the item is suitable for composting.
3. Students add their own examples and discuss them with the class.
4. Teachers lead a discussion about why plastic should never go into compost and what happens if it does.



## REFLECTION QUESTIONS

1. What happens to waste when we dispose of it correctly?
2. What does “residual waste” mean? What happens to it at the recycling center?
3. Why must we be very careful when composting?

## EXTENSION ACTIVITIES

1. Students create a poster with instructions for waste sorting in the school garden.
2. Using *Urban School Garden, a teacher's guide*, students build a compost bin.
3. Each student writes a letter to their parents, friends, or local older people encouraging them to sort waste properly.



# WASTE SORTING

## WORKSHEET

NAME:

CLASS:

DATE:



Mark the correct bin for each of the **waste items** listed below that you can find in the school garden or school kitchen. Write whether the item can be **composted**. Add your own ideas at the end.



WASTE ITEM	ORGANIC WASTE	PACKAGING	PAPER	GLASS	RESIDUAL WASTE	COMPOST (YES/NO)
Potato peels	X					yes
Weeds						
Fertilizer plastic bottle						
Wilted flowers						
Paper bag						
Bread leftovers						
Plastic bottle cap						
Salad leftovers						

# WASTE SORTING

## WORKSHEET

NAME:

CLASS:

DATE:



Mark the correct bin for each of the **waste items** listed below that you can find in the school garden or school kitchen. Write whether the item can be **composted**. Add your own ideas at the end.



WASTE ITEM	ORGANIC WASTE	PACKAGING	PAPER	GLASS	RESIDUAL WASTE	COMPOST (YES/NO)
Potato peels	X					yes
Eggshells						
Tea bags						
Tissue paper						
Meat leftovers						
Broken glass jar						
Rubber band						
Plastic bag						



# Circularity in the School Garden

## PREPARATION FOR TEACHERS

1. Ask each student to bring a notebook or a sheet of paper for taking notes (especially if the activity will take place in the school garden).
2. Prepare a worksheet template (you can use the sample provided below) where students will record products, raw materials, and their sources.
3. Bring a few sample items commonly found in the school garden or used for gardening (e.g. a plastic bottle, a trowel, a paper packaging, a seed bag).
4. Prepare a short explanation about the difference between a material and its source (e.g. plastic: material; oil: source).
5. Support students with visual aids or examples as needed.

## STEP-BY-STEP GUIDE

1. Each student writes a list (at least 10 items) of things they use in the school garden. The list can include everything; even pencils, notebooks, trowels, seed packets, or wheelbarrows. For each item, students determine the material and its source (e.g. plastic → oil, wood → tree).
2. Divide students into groups of 4–5. Each group compares their lists and selects five of the most common items.
3. Talk about the materials and sources of these items. Ask: “*Could any of these be made from more sustainable materials?*”
4. Students reflect on what happens to each item after use – can it be recycled, reused, or does it end up in a landfill?
5. Each group researches how long it takes for their selected materials to decompose.
6. This helps students understand the environmental footprint of everyday objects.



## REFLECTION QUESTIONS

1. Why do some materials decompose faster than others?
2. Which items in the garden could be reused or repurposed?
3. How can we reduce our use of unsustainable materials?

## EXTENSION ACTIVITIES

1. Students create a poster titled “Where Do Our Garden Tools Come From?” (or phones, cars, etc.), illustrating the journey of a raw material into a final product.
2. Groups compile a list of sustainable alternatives for everyday garden items.



# CIRCULARITY IN THE SCHOOL GARDEN 1

## WORKSHEET

NAME:

CLASS:

DATE:



Write down all the tools and materials you use in the school garden in the first column. Then identify which raw materials they are made of and what the original sources of those materials are. (See the example below for a planting pot.)



NO.	ITEM	MATERIAL	SOURCE
1.	<i>planting pot</i>	<i>plastic</i>	<i>oil</i>
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

# CIRCULARITY IN THE SCHOOL GARDEN 2

## WORKSHEET

NAME:

CLASS:

DATE:



Find out how long it takes for the sources of the materials from your list to decompose. Use reliable sources of information (books, educational websites, environmental databases, etc.).



NO.	ITEM	SOURCE	ESTIMATED DECOMPOSITION TIME
1.	<i>planting pot</i>	<i>oil</i>	<i>400-1000 years</i>
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			



# Poster for the Classroom or Garden

## TEACHER PREPARATION

1. Begin by introducing the three core principles of the circular economy: **Reduce, Reuse, Recycle.**
2. Prepare examples from the school garden (e.g. plastic bottles used as planters, collecting food scraps for composting).
3. Bring creative materials such as paper, colored pencils, scissors, glue, and magazines for cutouts.

## STEP-BY-STEP GUIDE

1. Start a conversation about the principles of the circular economy. Explain what each principle means and encourage students to find real-life examples in the school garden (e.g. reusing bottles as planters, composting organic waste).
2. Divide students into small groups and assign roles (recorder, idea leader, graphic designer, presenter).
3. Each group designs an informative and visually engaging poster to promote sustainable practices in the school garden.
4. The poster should emphasize the three key principles:
  - Reduce – prevent waste from being created.
  - Reuse – use items more than once or give them a new purpose.
  - Recycle – separate waste so it can be processed into new products.
5. Students include one example of good practice from the school garden (e.g. upcycled planters, composting, shared tools).
6. They add slogans, drawings, or magazine cutouts.
7. The presenter from each group shares the poster with the class.
8. Display all posters in the classroom or near the school garden.





## REFLECTION QUESTIONS

1. What does “reduce” mean in everyday life?
2. Which items in the school garden could be given a new purpose?
3. How does recycling help the environment?

## EXTENSION ACTIVITIES

1. Create a Circular Economy Corner at school to collect reusable materials or showcase upcycled projects.
2. Record and share examples of good practice from the school garden; through a video, school newsletter, or website.



**REDUCE,  
REUSE,  
RECYCLE!**



# Circular Action Plan for the School Garden

## TEACHER PREPARATION

1. Divide students into groups of 4–6 members.
2. Print one worksheet for each group.
3. Provide markers, sticky notes, clipboards, and planning paper.
4. Begin with a short recap of the main goals of the circular economy and the roles of different stakeholders (students, teachers, parents, community).

## STEP-BY-STEP GUIDE

1. Each group analyzes the current waste situation in the school garden; what waste is produced, where it appears, and how it is managed.
2. Groups describe the main challenges and propose specific actions (e.g. building recycling bins, collecting materials for reuse, reducing packaging waste).
3. Students complete their action plan by defining what they want to change, how they will do it, when they will do it, and who will help them.
4. Each group gives their plan a name and decides how to evaluate its success (e.g. observation, photos, peer feedback, short reports).
5. Groups prepare and present their final Circular Action Plan to the class.





## REFLECTION QUESTIONS

1. Which actions can we start this month?
2. Who can help us make these changes happen?
3. How will we know that our actions made a difference?

## EXTENSION ACTIVITIES

1. Present the Circular Action Plan to other classes, teachers, and school staff.
2. Create a “Before and After” video or photo story to document progress.
3. Share the plans with parents or the local community (e.g. parent council or local environmental group).



# CIRCULAR ACTION PLAN FOR THE SCHOOL GARDEN

## WORKSHEET

GROUP NAME:

GROUP MEMBERS:

CLASS:

DATE:



**TASK 1: Analyze where and what types of waste you notice in the school garden.**



LOCATION	TYPE OF WASTE	DETAILED DESCRIPTION OF THE WASTE	CURRENT WASTE MANAGEMENT PRACTICES	HOW COULD IT BE IMPROVED
garden bed	packaging	plastic bag that contained soil	bags are thrown in the bin	Arrange for a local farmer to deliver soil in bulk (no packaging)
	organic waste			
		plastic pots used for seedlings		
classroom				

**TASK 2: What do you think is the biggest problem with the current waste management situation? What could be improved?**



**TASK 3: Which actions could you take?**

Tick (✓) one or more options.



- |   |   |
|---|---|
| <input type="checkbox"/> Reducing the amount of waste         | <input type="checkbox"/> Reusing materials              |
| <input type="checkbox"/> Sorting waste                        | <input type="checkbox"/> Student education              |
| <input type="checkbox"/> Teacher education                    | <input type="checkbox"/> Cooperation with parents       |
| <input type="checkbox"/> Cooperation with the local community | <input type="checkbox"/> Making useful items from waste |

**Explain your choice: How would you use the selected actions to improve circularity in the school garden?**



**TASK 4: Think and write down who could help you implement your Circular Action Plan. What would their roles be?**



**TASK 5: Think again about what you want to change in waste management. Discuss how you will make it happen, what materials or resources you will need, who can help you, and set a deadline for completing the action.**



WHAT WE WANT TO CHANGE	HOW WE WILL DO IT	WHAT WE NEED	WHO WILL BE INVOLVED	WHEN WE WILL CARRY IT OUT
waste separation in the school garden	we will make recycling bins	old containers, buckets, brushes, paints, waterproof markers	grade 8 students, biology teacher, janitor, parents	by November 15
less plastic				

**TASK 6: Give your Circular Action Plan a name.**

**Be as creative as possible!** (Example: “Less Plastic, More Garden Magic!”)



A large rectangular area enclosed by a dashed green border, intended for writing the name of the Circular Action Plan.

**TASK 7: How will you check whether you have achieved your goals?**



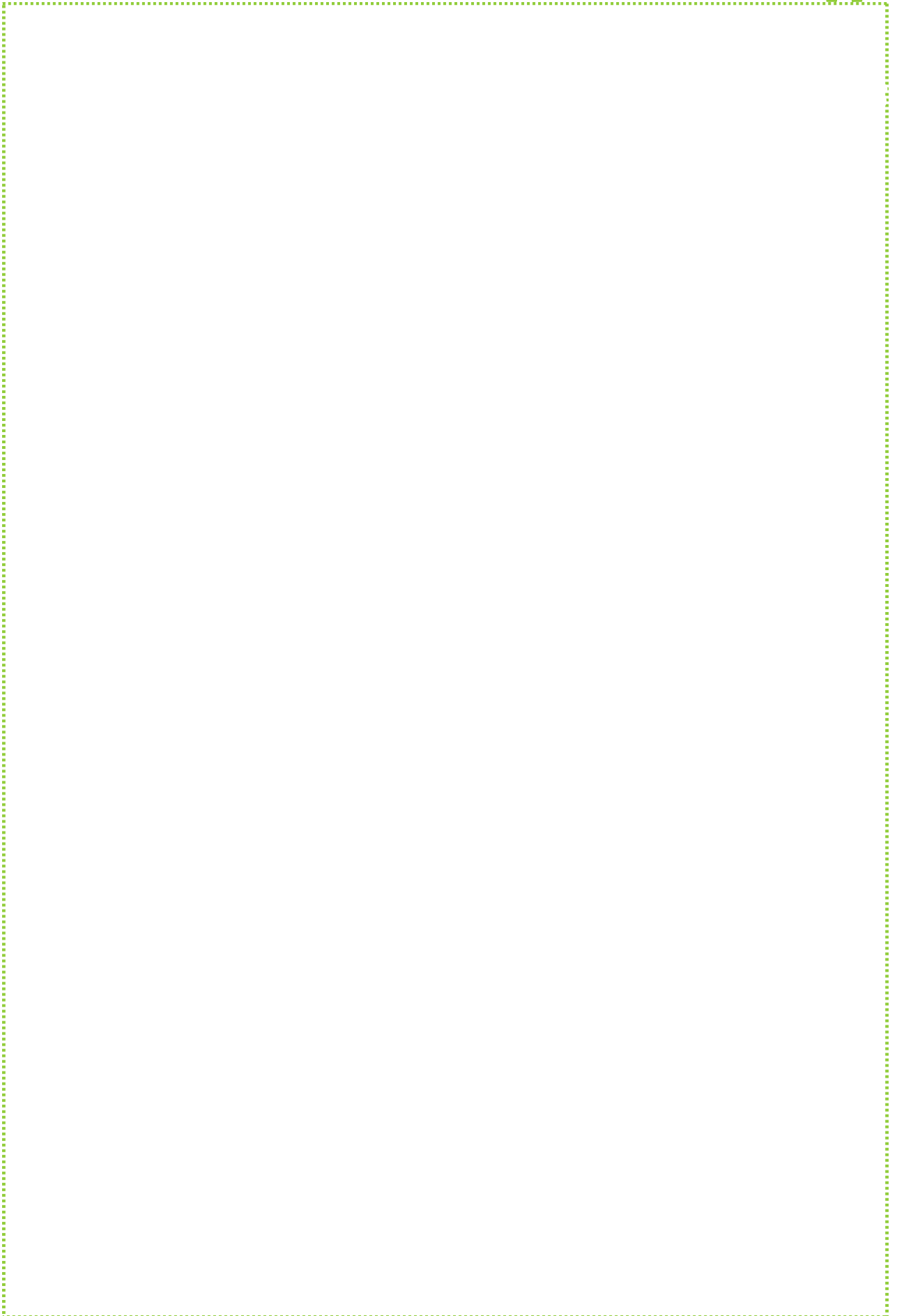
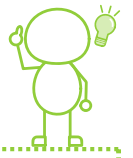
A large rectangular area enclosed by a dashed green border, intended for describing the methods to check for goal achievement.

**TASK 8: CIRCULAR ACTION PLAN!**

Based on everything you’ve written in the previous tasks – analysis of the current situation, proposed improvements, involvement of parents and the local community, planned actions, and the name of your plan; create your final Circular Action Plan. **Include** what you want to change and why, how you will implement it, who will help you, what resources you will need, how you expect it to go, how you will measure success. After carrying out your plan, don’t forget the **evaluation**: what worked best, where did you face the most challenges, what new things did you learn, what would you do differently next time, and how will you make sure your plan continues in the future?

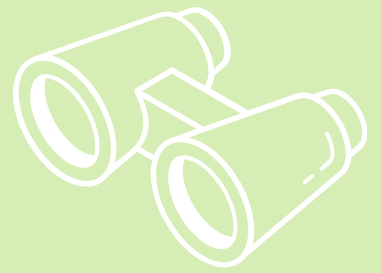


A large rectangular area enclosed by a dashed green border, intended for writing the final Circular Action Plan and evaluation.



## Further Exploration

- ***Urban school garden, a teacher's guide***
- ***Gardening Etiquette***
- ***Gardening Journal***
- *The Food & Beverage Carton Alliance*
- *SITRA*
- ***EU Commission: Circular Economy***
- *The Circular Design Guide*
- *Ellen MacArthur Foundation*





## MODULE 4

# *Developing Social Skills*

Urban school gardens are not only places for learning about gardening and sustainable practices, but also environments where students develop essential social skills – such as cooperation, communication, responsibility, and conflict resolution. Working together in the garden fosters a sense of community, strengthens peer relationships, and encourages intergenerational collaboration, all of which contribute to the personal growth and social development of students.

## Keywords

Environmental Studies, Science and Technology, Science, Biology, Home Economics, Visual Arts, Pair Work, Group Work, Gardening Etiquette, Role Play, Herbs, Random Draw, Flashcards, Parents, Grandparents, Conflict Resolution, Mediation, Outdoor Games, Event Organization, Checklist, Worksheet, Support, Puzzle, Ages 6–8, Ages 9–11, Ages 12–14

## Guidelines

Working in an urban school garden gives students the opportunity to develop key social skills through practical experience. By participating in group tasks, they learn to cooperate, listen to others, express their opinions, and respect agreements. The garden becomes a place that nurtures a sense of belonging, mutual trust, and responsibility for the community – a living classroom for learning about relationships with classmates, teachers, and the wider community.

### 1. Encourage teamwork and collaboration

- Organize activities where students work together (e.g., planting garden beds, planning layouts, building insect hotels).
- Assign specific roles within groups (e.g., team leader, note-taker, waterer, planter) so that everyone contributes according to their abilities

### 2. Develop communication skills

- Encourage students to listen to one another and reach decisions together (e.g., choosing which vegetables to plant).
- Include role-play activities or discussion-based games to help them express opinions constructively.

### 3. Teach conflict resolution

- Design tasks where groups identify possible disagreements in the garden (e.g., who uses the tools, who waters the bed) and come up with solutions.

### 4. Connect students with the local community

- Involve parents and grandparents in gardening activities (e.g., caring for seedlings at home).
- Invite local gardeners or community members to share their experience and knowledge with students.



## Objectives

- **Students participate in group activities** in the school garden, learning how to divide tasks, cooperate, and reach shared decisions.
- **Students develop communication skills** by listening to classmates, expressing their opinions, and resolving misunderstandings.
- **Students strengthen their sense of belonging** to the community by contributing to the maintenance and improvement of the school garden and by helping younger students.
- **Students learn about intergenerational cooperation** through collaboration with teachers, parents, and older community members.
- **Students create and follow garden rules** that promote responsibility and respect for nature.
- **Students develop empathy** by recognizing the needs and feelings of others and finding ways to enhance teamwork and cooperation through their actions.



# Activities

Ages 6–8



**Goal:** *Students develop basic social skills – sharing, cooperation, and listening – through play, nature, and teamwork in the garden.*

## 1. Gardening Etiquette

- Students create a simple set of garden rules together and illustrate them on a large poster to display near the garden or in the classroom. (You can use the Gardening Etiquette template for support.)



## 2. Young Gardeners

- Educational game: each student receives a role card (waterer, soil loosener, harvester, recorder). The game is repeated with rotating roles so everyone experiences different tasks and practices cooperation.

## 3. Herbal Friends

- Each student receives a herb to present as a friend (e.g., “This is lavender; it calms, smells nice and helps when you feel sad.”). Students then find a “related herb” and pair up. The activity fosters empathy and positive self-awareness.

## 4. Garden Keeper for a Day

- Each day, one student acts as the garden caretaker who greets the group, distributes tasks, and checks watering. Students learn leadership, responsibility, and organization.





**Ages 9–11**

**Goal:** *Students build self-confidence, express opinions, collaborate to solve problems, and deepen their understanding of group dynamics.*

## 1. Garden Mediators

- Role-play activity: students act out a garden conflict (e.g., who gets to harvest the lettuce?) using empathy, listening, and problem-solving cards. They take turns mediating and develop assertive communication.

## 2. Outdoor Games: Garden Scout

- Two movement-based and exploratory garden games: In the first, groups search for plants, animals, and tools, observing their uses and behaviors. In the second, one partner is blindfolded and guided to a garden bed by the other. Activities develop trust, observation, and teamwork.

## 3. Mission: Solve the Garden Mystery

- Groups receive an Escape room–style challenge with puzzles related to gardening (e.g., which plants grow well together). Success depends on collaboration and logical thinking.

## 4. Community Meals: Plan and Serve

- Students prepare a simple meal using garden produce (e.g., herbal tea, salad), serve it to others, and practice table manners, teamwork, and hospitality.



## Ages 12–14



**Goal:** Students strengthen interpersonal relationships, develop conflict resolution and project skills, and practice creative teamwork for the common good.

### 1. Green Challenge

- Groups take responsibility for a specific part of the school garden (herbs, compost, flower beds, etc.) for one month. They assign roles (leader, recorder, worker, observer) and learn leadership, coordination, and reflection.



### 2. Different but Green

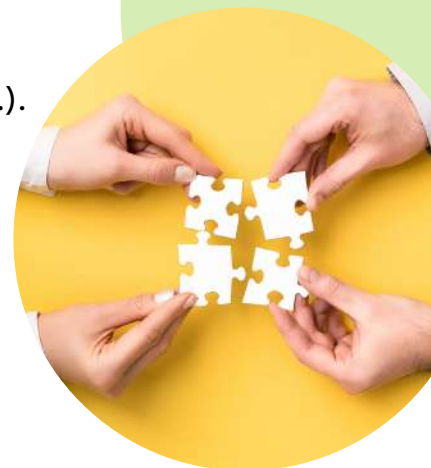
- Garden debate circle: students discuss different perspectives (e.g., ecological vs. industrial farming, vegan vs. omnivorous diets). They practice respectful communication and active listening.

### 3. The Green Support Package

- In pairs, students prepare a “Green Support Package” for a classmate: they choose three plants, assign symbolic meanings, and write a supportive message (e.g., rosemary – for courage). They then exchange and explain their choices.

### 4. Jigsaw: Sharing Knowledge Across Subjects

- Using the Jigsaw method, students explore garden-related topics (botany, soil, pests, local food, etc.). Expert groups research one topic, then teach their peers in home groups, creating a joint educational product for younger students (poster, guide, or game). This develops cooperative learning, responsibility, and cross-curricular understanding.



# Module 4: Developing Social Skills – LEARNING EXPERIENCES

Ages 6–8



## Young Gardeners

- Role-Play
- Group Work
- Worksheet

## Herbal Friends

- Exploring herbs
- Herb cards
- Worksheet



Ages 9–11



## Garden Mediators

- Conflict resolution
- Role-play
- Worksheet

## On a Mission: Solve the Garden Mystery.

- Escape room
- Outdoor games
- Group work

## Outdoor Games: Garden Explorer

- Observation and guidance
- Worksheet
- Group work, pair work



**Ages 12-14**



**Green Support Package**

- Pair work
- Symbolic meaning
- Worksheet

**Different – Yet Green**

- Group work
- Debate
- For and against discussion

**Jigsaw: Cross-Curricular Garden Knowledge**

- Group work
- Home and expert groups
- Topics and cards





# Young Gardeners

## TEACHER PREPARATION

1. Prepare illustrated role cards (e.g. a waterer, an observer, a recorder, a helper, etc.) and give one to each student at the start of the activity.
2. Divide students into small groups.

## STEP-BY-STEP GUIDE

1. Begin with a short discussion about garden tasks and present the different roles. Students then move to different garden stations, where they perform simple tasks according to their roles (watering, observing insects, taking notes, keeping paths tidy, etc.).
2. After a few minutes, students switch roles so that everyone can experience at least two different tasks.
3. At the end, gather in a circle to share experiences; which role they liked most and why. The activity promotes teamwork, understanding of shared responsibility, and develops a respectful attitude towards nature.

## REFLECTION QUESTIONS

1. Which garden task did you try for the first time today?
2. How are today's tasks similar to real-life jobs (e.g. a gardener, a researcher, an environmentalist)?

## EXTENSION ACTIVITIES

1. Photo Corner: Students take pictures while performing their tasks and create a Gardeners' album or classroom display.
2. Memory Game: Create pairs such as role-tool or role-action cards.

# YOUNG GARDENERS

## ILLUSTRATED ROLE CARDS



**WATERER**



**SOIL LOOSENER**



**HARVESTER**



**RECORDER**



**OBSERVER**



**GARDEN KEEPER**



**HELPER**



**PATH KEEPER**



# YOUNG GARDENERS

NAME:

CLASS:

DATE:



**WHICH ROLES DID I TRY TODAY? (CIRCLE ALL THAT APPLY.)**



WATERER

SOIL LOOSENER

HARVESTER

GARDEN KEEPER

OBSERVER

RECORDER

HELPER

PATH KEEPER

**WHAT DID I DO TODAY? (DRAW OR WRITE.)**



**I ENJOYED THE MOST BEING A:**



**BECAUSE:**



# Herbal Friends

## TEACHER PREPARATION

1. Prepare a selection of herbs in pots or freshly cut sprigs (you can also use dried samples or pictures if needed). For a class of up to 28 students, use at least 8 different herbs (about 3–4 students per plant).
2. Write name cards for each herb, including a short personality description (e.g. “*I’m lavender. I smell lovely and I help when you’re feeling sad.*”). Add symbols or small drawings to each card to make them accessible to students who are not yet fluent readers.
3. Arrange the classroom or garden so students can sit in a circle or move between herb stations.

## STEP-BY-STEP GUIDE

1. Each student chooses one herb (in a pot, as a picture, or a sprig).
2. Students observe, smell, and touch their herb.
3. Teachers then introduce each herb playfully, explaining its properties and typical uses.
4. Students become their herb and introduce themselves to the class, for example: “*I’m lavender. I help when you feel tense. My leaves smell lovely.*”
5. Guide them with questions such as: “*How do you smell? What can you do? How do you help people? Where do you like to grow?*”
6. Students walk around the room or garden, looking for their herbal friends; other herbs that share something in common, such as similar effects (e.g. calming), similar leaves, growing conditions, or fragrance.
7. During this activity, each student wears or carries a herb badge with an illustration, helping them find their “herbal family.”
8. Students then form pairs or small groups of related herbs and present their group to the class (e.g. “*We are herbs that calm and soothe.*”).



## REFLECTION QUESTIONS

1. If you could choose, which herb would you be?
2. What helpful qualities do your herbs have?

## EXTENSION ACTIVITIES

1. Scented Herb Book: Students create a class Book of Herbs; each contributes a drawing and a short description of their plant.
2. Herb Corner in the Classroom or Garden: Design a Herbal Corner together with students, planting or displaying the herbs used in the activity.

## NOTES FOR TEACHERS

### POSSIBLE PAIRS AND “HERBAL FAMILIES” BY COMMON CHARACTERISTICS

HERBAL FAMILY	MEMBERS	COMMON FEATURE
<b>Calming Herbs</b>	Lemon balm, lavender, chamomile	May help when you're sad, anxious, or unwell
<b>Herbs for the Tummy</b>	Mint, basil, marjoram	May help with stomach pain or poor appetite
<b>Herbs for Cough</b>	Thyme, marjoram, chamomile	May help with coughs or sore throats
<b>Awakening Herbs</b>	Rosemary, mint	May help you wake up and think clearly
<b>Strong-Scented Herbs</b>	Lavender, basil, rosemary	Have a strong, pleasant fragrance
<b>Herbs with Gentle Flowers</b>	Chamomile, lavender	Have soft, pretty flowers and a calming feel

## Template for Herb Cards



HERB	PART USED	EFFECT / USE	PERSONALITY CARD TEXT
<b>LAVENDER</b>	FLOWER	Calms, smells nice, may help you sleep	I'M LAVENDER. I SMELL CALMING AND HELP WHEN YOU FEEL SAD.
<b>MINT</b>	LEAF	Is refreshing, helps with stomach aches	I'M MINT. I'M FRESH AND I LOVE TO HELP WHEN YOUR TUMMY HURTS.
<b>LEMON BALM</b>	LEAF	Calms, relaxes	I'M LEMON BALM. I'M GENTLE AND CALM YOU WHEN YOU'RE WORRIED.
<b>THYME</b>	LEAF, FLOWER	Helps with coughs	I'M THYME. I'M STRONG AND HELP WHEN YOU HAVE A COUGH.
<b>ROSEMARY</b>	LEAF	Improves digestion, adds flavor	I'M ROSEMARY. I HELP YOU FEEL MORE ALERT AND READY TO LEARN.
<b>BASIL</b>	LEAF	Improves digestion, adds flavor	I'M BASIL. I SMELL LIKE PIZZA AND HELP YOUR TUMMY FEEL GOOD.
<b>CHAMOMILE</b>	FLOWER	Calms, eases pain	I'M CHAMOMILE. I'M GENTLE AND HELP WHEN YOU'RE SICK OR IN PAIN.
<b>MARJORAM</b>	LEAF	Helps with coughs, boosts appetite	I'M MARJORAM. I LOVE TO COOK AND MAKE YOUR MEALS TASTIER.

**Note:** In this activity, the term “herb” is used broadly – it refers to any plant used for its fragrance, flavor, or traditional uses. This includes plants such as chamomile and lavender, as they are well-known and engaging for children.

# MY HERBAL FRIEND

NAME:

CLASS:

DATE:



**CIRCLE YOUR HERB.**



LAVENDER

MINT

LEMON BALM

CHAMOMILE

THYME

ROSEMARY

MARJORAM

BASIL

**DRAW YOUR HERB.**

**MY HERB IS SPECIAL  
BECAUSE:**



**I FOUND A FRIEND FOR MY HERB!**

**THE NAME OF MY FRIEND'S HERB:**

**WHY WE ARE SIMILAR:**





# Garden Mediators

## TEACHER PREPARATION

1. Prepare role cards: Participant A, Participant B, Mediator, Observer.
2. Prepare communication strategy cards for mediators:
  - I listen without interrupting.
  - I say how I am feeling.
  - I suggest a solution that works for both sides.
  - I repeat what I have heard.
  - I ask what we could do differently.
3. Print conflict situation cards related to garden activities.
4. Arrange the classroom or garden space to allow role-play and a circle for reflection afterward.

## STEP-BY-STEP GUIDE

1. Start with a short discussion: “*What is a conflict? Can it happen in the school garden?*” Encourage students to share examples (e.g., who gets to water the plants, who picks the vegetables, who has stepped on a seedling). Explain that today they will play roles to learn how to solve conflicts like true mediators.
2. Divide the class into groups of four: two participants, one mediator, and one observer. If you have an uneven number of students, some observers can watch two groups or help with reflection.
3. Each group receives one conflict scenario. The mediator uses the strategy cards to guide the conversation.
4. After about 10 minutes, groups switch roles (and optionally conflict cards) so everyone experiences being a mediator.
5. Groups discuss how they solved their conflict, which strategy worked best, and how each role felt. Lead a short group reflection about communication, empathy, and fairness.



## REFLECTION QUESTIONS

1. Can you name a few more examples of conflicts that might happen in the school garden?
2. Do you think you could use these conflict-resolution strategies in everyday life? How?

## EXTENSION ACTIVITIES

1. Poster *The Green Agreement*: In groups, students create short, positive rules such as “*In the garden, we listen to each other. We share the work. We solve conflicts with words.*”
2. Students prepare short role-plays for younger classes about solving garden conflicts peacefully.





## ROLE CARDS

**OBSERVER**

**MEDIATOR**

**PARTICIPANT B**

**PARTICIPANT A**

## COMMUNICATION STRATEGY CARDS

**I ask what we could do differently.**

**I repeat what I have heard.**

**I suggest a solution that works for both sides.**

**I say how I am feeling.**

**I listen without interrupting.**

## CONFLICT SITUATION CARDS

**One student wants to be the leader, and the other can't get a word in.**

**Someone stepped on a seedling and doesn't want to admit it.**

**One student forgot to water the plants. Another student is angry.**

**Who will pick the lettuce? They both want to.**

# GARDEN MEDIATORS

NAME:

CLASS:

DATE:



Today I played the role(s) of:



PARTICIPANT



MEDIATOR



OBSERVER

Describe the most interesting situation:



**Mediator:** What did you say to help solve the conflict?

**Participant:** How did you express your view?

**Observer:** What did you notice about how others communicated?

How did you resolve the conflict?

What makes a good mediator?

- Listens to others.
- Interrupts before someone finishes.
- Suggests solutions for both sides.
- Stays silent and doesn't engage.
- Asks what others think and feel.



What would you do differently next time?





# On a Mission: Solve the Garden Mystery

## TEACHER PREPARATION

1. Prepare 3–5 different tasks, riddles, or challenges for students to solve in sequence (like a mini escape room).
2. Gather materials for each task (e.g., plant pictures, a box with a key, a garden map, secret codes, paper clues).
3. Prepare a starting envelope for each group with mission instructions.
4. Divide students into groups of 4–6. Each group has the same number of tasks but may start in a different order.



## STEP-BY-STEP GUIDE

1. Explain to students that they are on a mission to solve riddles and uncover the secret of the school garden.
2. **Working at Stations:** Each group starts with Envelope 1. When they solve the task correctly, they receive the next one. If they get stuck, they may use a help card (the teacher deducts one point).
3. For every task, students write down their answer and a short explanation.
4. When all groups finish, compare the answers and discuss which clues led them to the correct solutions.





## REFLECTION QUESTIONS

1. Which task was the most difficult and why?
2. How did you divide the roles within your group?
3. Which task was the most fun?
4. What did your group learn about plants or gardening?

## EXTENSION ACTIVITIES

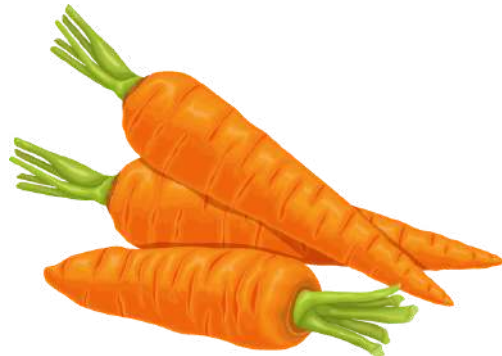
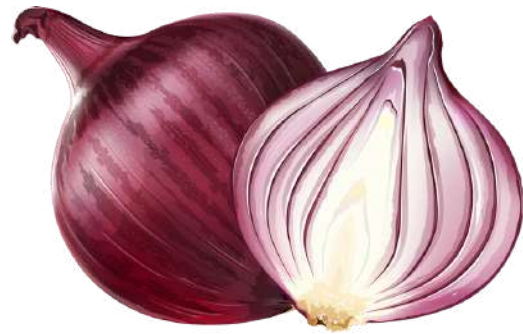
1. Themed escape room: The entire class designs a real-life garden escape room for younger year groups.
2. Digital Mission: Use tools like *Genially* to create a digital escape room focused on gardening and sustainability themes.



# ENVELOPE 1

## The Best Garden Friends

On the garden sheet, you will find pictures of six plants.  
Choose TWO that grow very well together; they help each other.



Group:

# ENVELOPE 2

## Seed Code

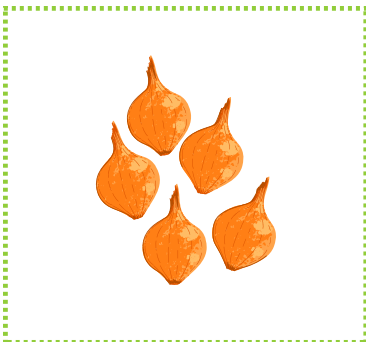
You'll find three kinds of seeds, three pictures, and three descriptions. Match each description to the correct seed and picture. Do you recognize all the plants?



My flowers are yellow and follow the sun. I can grow taller than you are!



I grow quickly. My leaves are eaten fresh. In summer, I like a bit of shade.



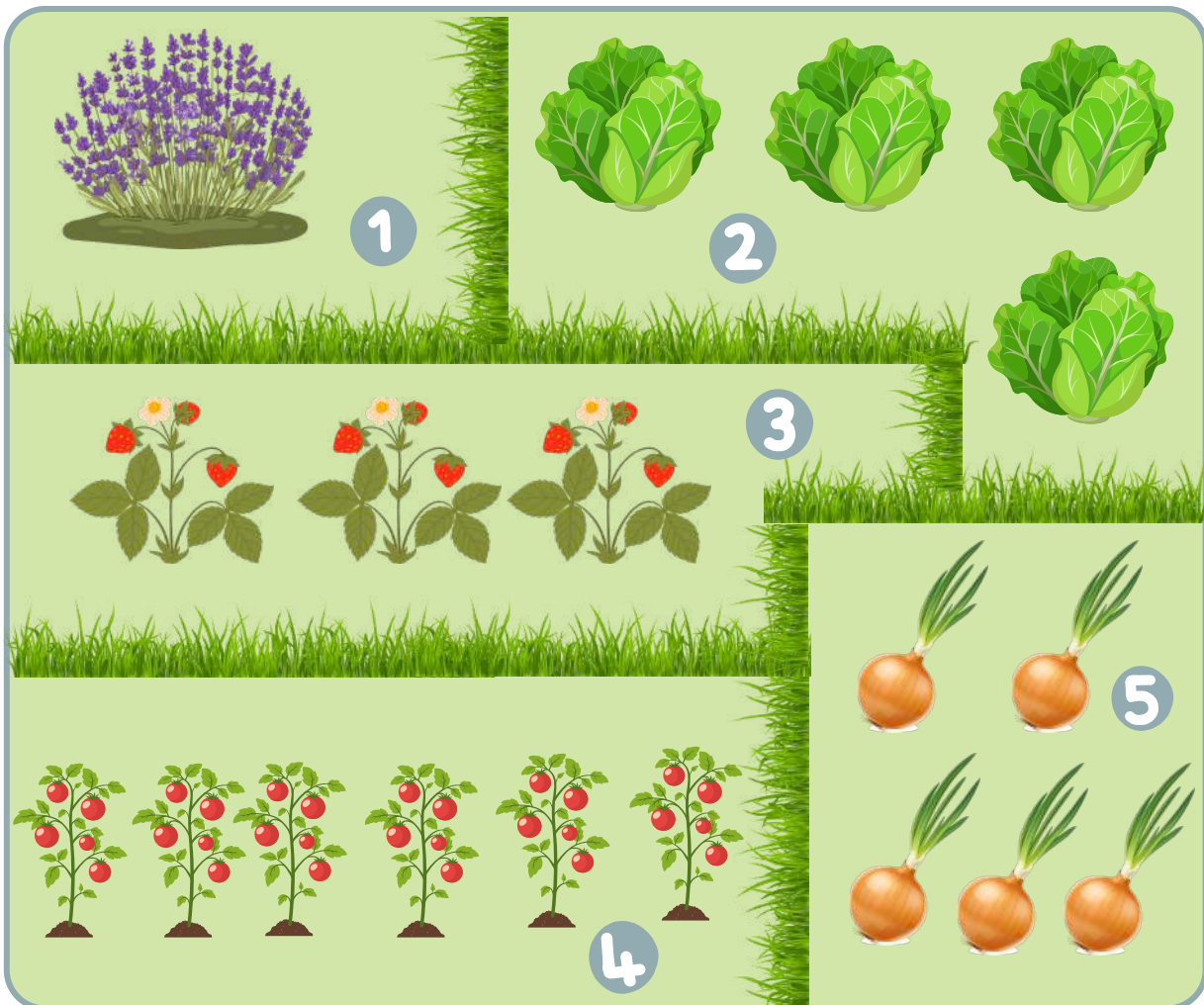
If you cut me, you might cry. I'm used in soups and sauces.



# ENVELOPE 3

## Garden Map

Look at the map of the school garden.  
There are numbers from 1 to 5. One of the beds has small green leaves growing in neat rows; that's lettuce!



1. Name all the plants in the garden.

2. Write the number of the lettuce bed and describe two things that helped you recognize it.

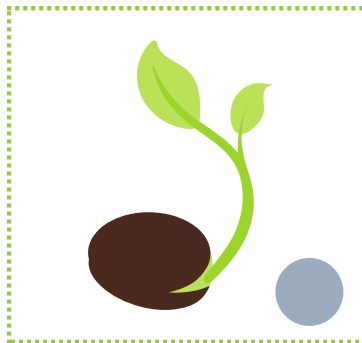
Group:

# ENVELOPE 4

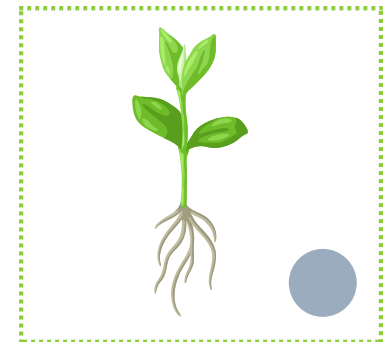
## From Seed to Fruit

Put the pictures in the correct order and write one thing that a plant needs to grow.

- 1 Seed
- 2 Sprout
- 3 Young Plant
- 4 Flower
- 5 Fruit



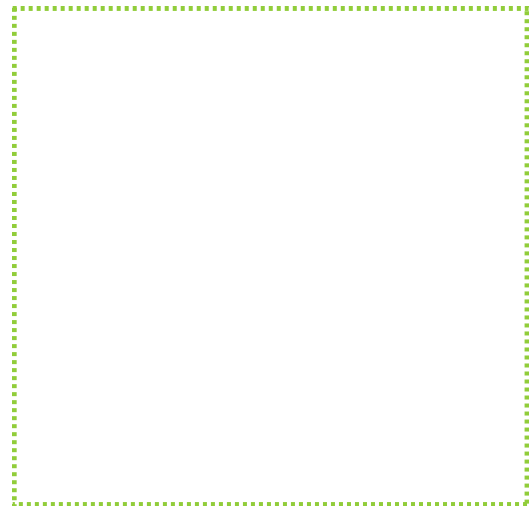
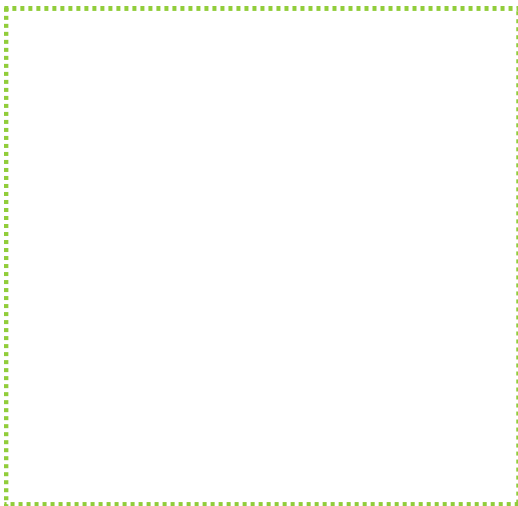
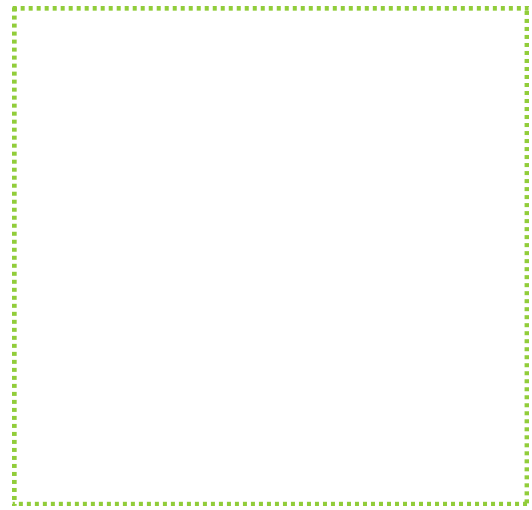
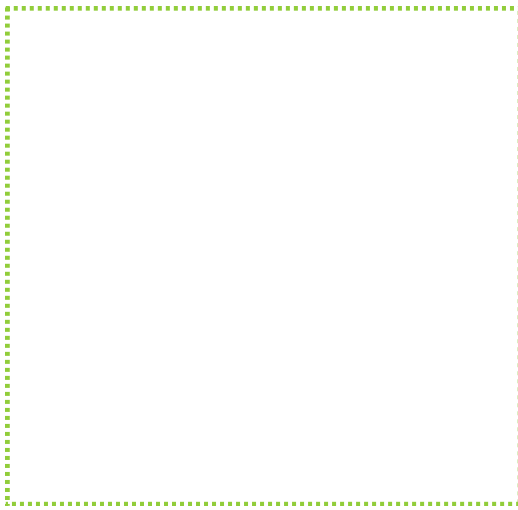
A plant needs:



# ENVELOPE 5

## The Secret Word

In the box, you'll find pictures or small parts (leaves, stems) of four garden plants. Look carefully and identify each plant. Then take the first letter of each plant's name. Put the letters together to form a secret word that's important for every gardener! When you discover the word, whisper it to your teacher to complete the mission!



**SECRET WORD:**

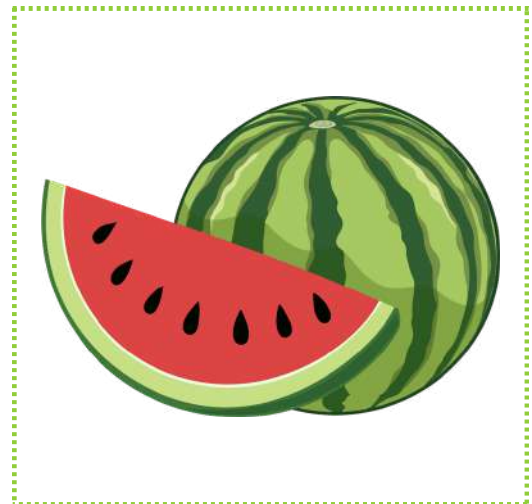
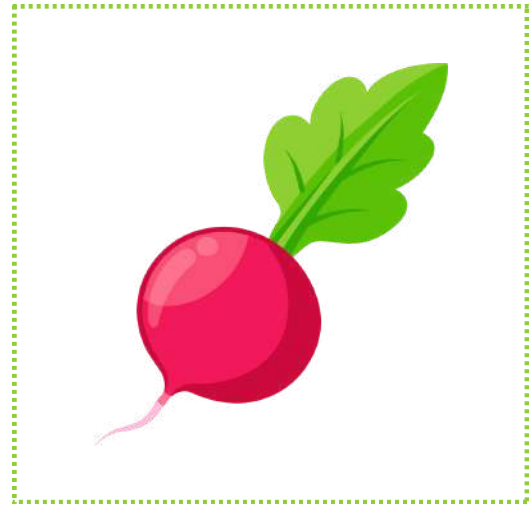
**Group:**

# ENVELOPE 5

## ADDITIONAL NOTES

Cut out the pictures and put them in a small box or envelope. Students must identify each plant and use the first letter of each plant's name to form the secret word.

HINT: You can hide real examples (e.g., a clove of garlic or a slice of onion) for a sensory version of the task.



# ***SOLUTIONS***

## **ENVELOPE 1:**

**Tomato and basil** – Basil helps keep pests away and makes tomatoes grow better.

## **ENVELOPE 2:**

**Correct matches: Onion – Lettuce – Sunflower**

1 2 2, 2 1 3, 3 3 1

## **ENVELOPE 3:**

**1. Lavender, 2. Lettuce, 3. Strawberry, 4. Tomato, 5. Onion**

How we recognized lettuce: green leaves, growing close to the ground and in rows.

## **ENVELOPE 4:**

**Cards to arrange: Seed → Sprout → Young Plant → Flower → Fruit**

Plants need sunlight, water, air, and soil to grow.

## **ENVELOPE 5:**

Garlic → G

Radish → R

Onion → O

Watermelon → W

**SECRET WORD: G R O W**

# *On a Mission:*

## **SOLVE THE GARDEN MYSTERY!**

Welcome, Garden Explorers!

You have an important mission ahead of you. You must solve five challenges to discover the secret word that will earn you a special reward!



Dear Garden Explorers,

Work together as a team. Think, ask questions, and help each other. For every challenge you solve, you'll receive a new envelope. If you get stuck, you can use your HELP CARD, but only once! Good luck, and may the garden wisdom guide you!

# HELP CARD

**You can use this card only once during the game if the task feels too difficult or if your group gets stuck.**

When you decide to use it, ask the teacher for help.

The teacher will give you one of the following:

- a hint,
- an extra guiding question, or
- a tool to help you continue (e.g., an illustration, a picture card, or a book).

Each group can use only one help card, so think carefully before using it! Try to find a solution together first.

**We used our help card for task number:**

**Why did we need it?**

**Remember:**

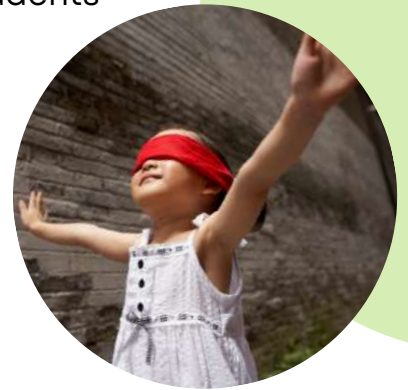
**“A true explorer does not give up; they know how to ask for help.”**



# Outdoor Games: Garden Explorer

## TEACHER PREPARATION

1. Prepare search lists with 10 items (e.g., plant, animal, tool, etc.) for each student group.
2. Write instructions for the trust game (one student wears a blindfold, the other leads).
3. Provide a timer or sand timer to measure the duration of each game round.
4. Prepare ribbons or scarves for blindfolding (for the paired activity).
5. Clearly mark the boundaries of the play area and warn students about possible hazards (e.g., uneven ground, water).
6. Prepare notebooks or worksheets for students to record their observations.



## STEP-BY-STEP GUIDE

### GAME 1: GARDEN SEEKERS

1. Divide students into groups of 3–5. Each group receives a list of 10 items they need to find:
  - 3 plants
  - 2 animals (e.g., a bee, a snail)
  - 2 gardening tools
  - 3 other natural elements (e.g., a stone, a leaf, a shadow)
2. Students note the following during their search:
  - Where they found the object or organism,
  - What the animal was doing,
  - What the tool is used for,
  - The growth stage of the plant (seed, sprout, young plant, flowering, fruit).
3. At the end, each group presents the most interesting plant and the most unusual animal observation to the class.



## GAME 2: LEAD ME THROUGH THE GARDEN

1. Before starting, the teacher marks a safe path through the garden and warns about possible risks (wet tiles, raised beds, beehives, etc.).
2. Students work in pairs: one student wears a blindfold, while the other guides their partner using their voice or gentle touch along the path from the entrance to a chosen garden bed. Then they switch roles.
3. The teacher sets short challenges, such as: “*Stop by a plant and describe it.*”
4. After the activity, each pair shares how they felt; what was easiest and what was most difficult for them.

## REFLECTION QUESTIONS

1. How did you feel when you were guiding your classmate? What about when you were being guided?
2. What was the hardest part when your eyes were covered? What was the easiest?

## EXTENSION ACTIVITIES

1. **Silent Guide:** An advanced version of the blindfold game; the leader must not speak and can only guide their partner by touching their shoulders.
2. **Eco Detective:** Students research at home why certain animals appear in the garden and what role they play in maintaining ecological balance.





# Garden Explorer

## WORKSHEET

Group members:

Class:

Date:



### PLANT No. 1

Where did we find it?

What do we observe?

Growth stage (circle one):

SEED    SPROUT    YOUNG PLANT  
FLOWER                  FRUIT



### PLANT No. 2

Where did we find it?

What do we observe?

Growth stage (circle one):

SEED    SPROUT    YOUNG PLANT  
FLOWER                  FRUIT



### PLANT No. 3

Where did we find it?

What do we observe?

Growth stage (circle one):

SEED    SPROUT    YOUNG PLANT  
FLOWER                  FRUIT

**ANIMAL No. 1:** Where did we find it? What was it doing there?



**ANIMAL No. 2:** Where did we find it? What was it doing there?



**TOOL No. 1:** Where did we find it?  
What do we use it for?



**TOOL No. 2:** Where did we find it?  
What do we use it for?



**THREE NATURAL ELEMENTS** (List them below).





# Green Support Package

## TEACHER PREPARATION

1. Prepare a list of plants with their possible symbolic meanings (you can use the template provided below).
2. Prepare small envelopes, boxes, or paper bags for the “Green Support Package.”
3. Gather plant samples – drawings, seeds, dried herbs, or symbolic pictures.
4. Prepare a system for random pairing (e.g., name cards, slips of paper, or a digital draw accessed via QR codes).
5. Ensure a safe and respectful atmosphere, as this activity may involve emotional sharing and reflection.



## STEP-BY-STEP GUIDE

1. Start with a class discussion: “*What does it mean to support a classmate? Why do we sometimes need encouraging words? How do plants support each other in nature?*”
2. Each student draws the name of their partner (they should keep the name secret).
3. Encourage students to observe their partner and reflect on which qualities or strengths they would like to encourage.
4. Each student selects three plants for their classmate. For each plant, they write:
  - the symbolic meaning, and
  - a personal message (e.g., “Lavender – for calm. May it help you breathe when you’re under pressure.”).
5. Students then assemble their Green Support Package; they write, draw, or collect plant samples, add messages, and place everything into their envelope or bag.





6. When everyone is ready, the teacher gives the signal: *“It’s time to exchange your Green Support Packages!”*
7. Students exchange their packages, explain their choices, and listen to their partner’s reactions.
8. Conclude with a group reflection on what they felt and what they learned about themselves and others.

## REFLECTION QUESTIONS

1. How did you feel when you gave your Green Support Package?
2. Which plant would you choose as your own symbol? Why?
3. Could the idea of a “Green Support Package” be applied to other areas of life?

## EXTENSION ACTIVITIES

1. Green Corner of Support: The class creates a box for anonymous supportive messages using plant symbols. Students can leave notes for one another.
2. Seed Bombs: Students make seed balls using the seeds of three plants. Their classmates can take them home and plant them as a symbol of growth and encouragement.



# Green Support Package

## WORKSHEET

Name:

Class:

Date:



### 1. Name of my partner:



### 2. My three chosen plants:

- **Plant 1:**
- My message:
- Meaning:
  
- **Plant 2:**
- My message:
- Meaning:
  
- **Plant 3:**
- My message:
- Meaning:



### 3. How did my partner feel when they received the package?











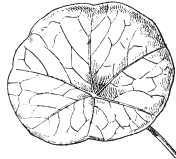



### 4. How did I feel when I received my package?



# Green Support Package



Examples of Plants and Their Symbolic Meanings  
(Teachers can print and cut these into individual cards.)

<p>ROSEMARY <b>COURAGE</b></p> 	<p>LAVENDER <b>INNER PEACE</b></p> 	<p>MINT <b>FRESHNESS AND FOCUS</b></p> 
<p>THYME <b>PERSEVERANCE</b></p> 	<p>SAGE <b>PROTECTION AND WISDOM</b></p> 	<p>DANDELION <b>RESILIENCE</b></p> 
<p>SUNFLOWER <b>JOY</b></p> 	<p>BASIL <b>STRENGTH AND HEART</b></p> 	<p>NASTURTIUM <b>CREATIVITY</b></p> 
<p>OREGANO <b>SELF-CONFIDENCE</b></p> 	<p>CHAMOMILE <b>COMFORT</b></p> 	<p>MARIGOLD <b>RECOVERY</b></p> 



# Different – Yet Green

## TEACHER PREPARATION

1. Choose current topics related to the environment, food, and everyday life (e.g. local vs. imported food; organic vs. conventional farming.)
2. Prepare topic cards with short descriptions and assigned roles or viewpoints.
3. Provide a worksheet for noting down main arguments, counterarguments, and shared conclusions.
4. Arrange the discussion space (ideally outdoors) in a circle of chairs, mats, or blankets to encourage equality and open dialogue.
5. Divide students into groups of 4–5. Each group receives one topic card and assigned viewpoints to prepare for.



## STEP-BY-STEP GUIDE

1. Start with a class discussion about what it means to have different opinions, why listening is important, and how to communicate respectfully.
2. Present the basic rules of debate: Speak one at a time, do not interrupt others, and support your opinion with arguments and examples.
3. Each group draws one topic card and a role (for or against). Students work together to prepare their key statements and counterarguments. Encourage them to use examples from their own experiences or from the school garden.
4. Groups with the same topic present their positions one after another. After both sides finish, they try to find a shared conclusion, such as: “We agree that ...”, “We understand that there are different views, but ...”
5. After the debates, discuss how it felt to listen, respond, and defend opinions.





## REFLECTION QUESTIONS

1. Which argument from the opposite team did you find the strongest? Why?
2. Which of your team's arguments did you think was the most convincing? Why?
3. How did you feel during the debate?

## EXTENSION ACTIVITIES

1. Creative Poster: Each group creates an infographic or visual summary showing both sides of the debate and the key takeaways.
2. Guest speaker: Invite a local farmer, vegan chef, or organic producer to share their perspective.



# Different – Yet Green

## DEBATE CARDS

- Each group receives one card with a topic and a specific standpoint (for or against). Students prepare arguments to defend their position during the debate.



<p>Organic food is better than industrially produced food.</p> <p>Your position:</p> <p><b>FOR</b></p>	<p>Organic food is better than industrially produced food.</p> <p>Your position:</p> <p><b>AGAINST</b></p>
<p>Local food is always more sustainable than imported food.</p> <p>Your position:</p> <p><b>FOR</b></p>	<p>Local food is always more sustainable than imported food.</p> <p>Your position:</p> <p><b>AGAINST</b></p>
<p>Vegetarianism is more environmentally friendly than an omnivorous diet.</p> <p>Your position:</p> <p><b>FOR</b></p>	<p>Vegetarianism is more environmentally friendly than an omnivorous diet.</p> <p>Your position:</p> <p><b>AGAINST</b></p>
<p>Every school should have its own school garden.</p> <p>Your position:</p> <p><b>FOR</b></p>	<p>Every school should have its own school garden.</p> <p>Your position:</p> <p><b>AGAINST</b></p>



# Different – Yet Green

## DEBATE CARDS

- Each group receives one card with a topic and a specific standpoint (for or against).
- Write your ideas in the blank spaces.



<p>Composting should be mandatory for all schools that have a garden.</p> <p>Your position:</p> <p><b>FOR</b></p>	<p>Composting should be mandatory for all schools that have a garden.</p> <p>Your position:</p> <p><b>AGAINST</b></p>
<p>Every city resident should have their own garden.</p> <p>Your position:</p> <p><b>FOR</b></p>	<p>Every city resident should have their own garden.</p> <p>Your position:</p> <p><b>AGAINST</b></p>
<p>Your position:</p> <p><b>FOR</b></p>	<p>Your position:</p> <p><b>AGAINST</b></p>
<p>Your position:</p> <p><b>FOR</b></p>	<p>Your position:</p> <p><b>AGAINST</b></p>





# Jigsaw: Cross-Curricular Garden Knowledge

## TEACHER PREPARATION

1. Choose 4–6 thematic areas related to gardening or the natural sciences.
2. Prepare learning materials – books, articles, photos, digital resources, or physical items from the garden.
3. Divide students into home groups (4–6 students each). Then assign each student to an expert group based on the chosen topic.
4. Prepare templates for the final product (poster, guide, quiz, or educational game) and a self-evaluation worksheet for students.

## STEP-BY-STEP GUIDE

### 1. Home Group – Introduction:

- Each group receives a set of materials covering 4–6 different topics.
- Every student selects one topic of interest and focuses on researching it in depth.
- Students take basic notes and prepare to share knowledge with others.

### 2. Expert Group – In-Depth Learning:

- Students join peers who have chosen the same topic to form expert groups.
- Within their expert group, they exchange information, clarify concepts, and prepare a short presentation or teaching aid.
- They may create a poster, mind map, or short presentation to help explain their topic to others.

### 3. Home Group – Teaching Others:

- Students return to their home groups.
- Each student now becomes the teacher for their topic and explains it to their group members.
- The group works together to create a final shared product – for example an educational poster, a garden guidebook, or a quiz.

### 4. Presentation and Reflection

- Each group presents its final product to the class or to younger pupils.
- Lead a group reflection on what they learned, how they worked together, and any challenges they faced.



## REFLECTION QUESTIONS

1. How can you apply what you've learned in the school garden? Describe one practical action your group could take.
2. Did you use reliable sources for your research? How can you recognize trustworthy information?

## EXTENSION ACTIVITIES

1. Artistic Interpretation: Create an illustrated or comic-style garden guide.
2. Garden Integration: Display the results directly in the school garden. In each garden area, add signs, posters, or tasks for other classes to explore and learn from.

## NOTES FOR TEACHERS

### POSSIBLE FINAL PRODUCTS:

- A learning poster combining drawings, facts, and simple tasks for younger students.
- A garden guidebook or leaflet in picture-book format.
- An educational board or card game (e.g. a memory, a garden maze, a quiz).
- An interactive exhibition in the classroom, hallway, or outdoor garden area.





## EXAMPLES OF FINAL PRODUCTS

### GAME: THE GARDEN QUIZ CIRCLE

#### Instructions:

- Each expert group prepares 3–5 quiz questions related to their topic.
- Questions are written on colored cards (e.g. green for soil, red for fruit, yellow for insects ...).
- On the back of each card, students write a point value (1–3 points depending on difficulty).
- Play the game in a circle: younger students pick cards, answer the question, and collect points.

#### Example card:

Question: Which vitamins can be found in an apple?

- a) Apples contain no vitamins.
- b) Apples contain mainly vitamin C, plus small amounts of other vitamins (e.g. A, E, B vitamins).
- c) Only vitamin C.

### FOR YOUNGER LEARNERS: “ALL ABOUT OUR GARDEN” BOOKLET

- **Front cover:** Title page with the name “All About Our Garden” and an illustrated garden scene showing symbols or icons of each group’s topic.
- **Introduction:** A short text and drawing of the school garden: who works there and what they grow.
- **Main section:** Pages created by expert groups – each includes a short informative text, an illustration or a photo, a small quiz or task (e.g. “Draw a pollinator you saw in our garden!”).
- **Back cover:** “Test Your Knowledge!” – a recap game or quiz for review.





# Cross-Curricular Garden Knowledge

## Expert Group Topics and Question Cards

### BOTANY



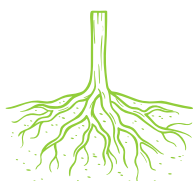
Name the main parts of a plant and describe their functions.

What is photosynthesis, and why is it important?

List the stages of plant growth and briefly describe each stage.

Why are plants essential for life on Earth?

### SOIL AND COMPOST



What are the three basic components of soil?

What is humus, and why is it important?

What materials can be composted, and what should not be put into compost?

Why is composting beneficial for the garden and the environment?

### PESTS AND BENEFICIAL ANIMALS



Name three common garden pests and explain how they affect plants.

Name three beneficial animals and explain how they help plants.

Give one example of an ecological method for protecting plants.

What does the term "natural balance" mean in the context of a garden?

### NUTRITIONAL VALUE OF LOCAL FOOD



Why are fruits and vegetables important for our health?

What do the terms "season food" and "local food" mean?

Name three vitamins and one food that contains each of them.

Why can eating locally produced food be more sustainable than eating imported food?

### THE GARDEN THROUGH THE SEASONS



What do we sow in spring, summer, and autumn?

Which plants grow best during summer?

What happens in the garden during winter?

Why is it useful to have a planting and sowing plan?

### MEDICINAL HERBS



Name three medicinal herbs and explain what they are used for.

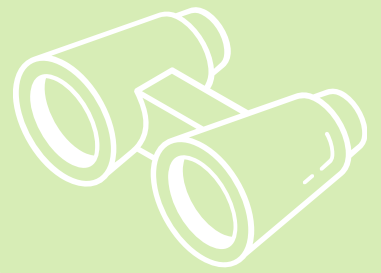
How do we prepare herbal tea?

Why is it important to understand the effects of herbs?

Why is it good to have herbs in the garden?

## Further Exploration

- ***Urban school garden, a teacher's guide***
- ***Gardening Etiquette***
- ***Gardening Journal***
- *Teaching resources*
- *87 Examples of Social Competence*



The background of the page features a vibrant blue sky with scattered white clouds. In the foreground, the silhouettes of three individuals—a woman on the left and two children in the center and right—are standing on a grassy hill. Each person is holding a bicycle and has their arms raised in a celebratory gesture. The sun is positioned behind the woman on the left, creating a bright glow and casting long shadows. A large white circle is centered on the page, containing the text for the module.

## MODULE 5

# *Sustainable Mobility*

Sustainable mobility is an important part of creating cleaner environments and healthier lives in cities. By linking the urban school garden with active and eco-friendly modes of transport, students learn how their everyday travel choices affect their carbon footprint and the air quality in their community.

## Keywords

Environmental studies, science and technology, biology, home economics, visual arts, mathematics, chemistry, model-making, journal, questionnaire, analysis, knowledge check, worksheet, walking, green mobility, carbon footprint, CO<sub>2</sub>, transport, traffic safety, community garden, primary and secondary education.

## Guidelines

Sustainable mobility is essential for reducing environmental impacts in cities and improving overall quality of life. Linked to the urban school garden, students can explore how transportation, air quality, gardening, and sustainable development are interlinked.

### 1. Connect sustainable mobility with the school garden

- Discuss how students travel to school or to the garden (on foot, by bike, by car) and how they could increase the share of “green” journeys.
- Encourage students to investigate how traffic and air pollution affect the garden environment – for example, how exhaust gases might influence plant health or crop quality.

### 2. Highlight the importance of sustainable transport modes

- Together with students, explore how active mobility (walking, cycling, using a scooter) supports physical health and well-being, while reducing the carbon footprint.
- Compare different means of transport and the resources they require (fuel, energy, materials).

### 3. Explore the local community

- Invite a representative from the municipality or a local environmental organization to present ideas for improving safe and sustainable routes to school and to the garden.
- Organize an outdoor learning walk around the neighborhood to record traffic safety issues, missing bike paths, or green spaces that support sustainable travel.

### 4. Learning beyond the classroom

- Plan a visit to a community or educational garden using a green mode of transport (on foot, by bike, or by public transport).
- Encourage students to reflect on the benefits and challenges of traveling sustainably and to propose improvements for safer and greener access to shared green spaces in their area.

## Objectives

- **Students explore** the importance of sustainable mobility in reducing the carbon emissions and improving air quality in urban areas.
- **Students recognize** the link between their travel habits and their environmental impact, evaluating how they can contribute to a greener community.
- **Students analyze** their route to school and the school garden, identifying improvements that support sustainable mobility.
- **Students choose** and use active modes of transport (walking, cycling, scooter, public transport) for traveling to school and the garden, reflecting on their positive effects on health and the environment.
- **Students visit** a community or educational urban garden using environmentally and health-friendly means of transport (on foot, by bike, or by public transport) and assess how access and safety could be improved.
- **Students plan and carry out** initiatives that promote sustainable mobility within their school and local community, raising awareness among peers and parents about the importance of green travel routes.
- **Students collaborate** with school and local stakeholders (e.g., municipal representatives, waste management services, traffic experts) to improve the conditions for sustainable mobility.



# Activities



**Ages 6–8**

**Goal:** *Students learn why walking and cycling are good for their health and the environment, and they reflect on how to travel safely and sustainably to the school garden.*

## 1. Green Steps to the Garden (Tracking Our Routes)

- Students record how they travel to school or the school garden for one week (on foot, on a scooter, by bike, or by car).
- Together, they create a group poster for the garden, titled: *“What Would Our Journey Look Like Without Cars?”*



## 2. Sensory Herb Trail and a Walking Reflection

- Students create a simple sensory path in the school garden using natural materials (bark, pebbles, dried herbs). They walk barefoot, describe their sensations, and get to know the plants.
- Garden Train (Role-play): Students form a “human train” moving through the garden. At each stop (a plant, a bush, or a tree), they complete a small task – e.g., pick three mint leaves, find a bee, observe a snail.
- Afterwards, they discuss why walking, cycling, and using a scooter are better for the environment than travelling by car.



## 3. Creative Workshop: Model Building

- In groups, students build a model of the school area showing the routes to the garden – including walking paths, bike racks, and green spaces.

## 4. Visit to a Community Learning Garden

- Students travel to a community or educational garden on foot or by bus (depending on the distance).
- On the way, they observe safe crossings, traffic signs, and count bicycles and cars.
- At the garden, they reflect on why walking is good for both the environment and their own well-being.



**Ages 9–11**

**Goal:** *Students observe, measure, and plan to design and promote safe, healthy, and low-carbon routes to school and the school garden.*

## 1. Travel Journal and Parent Survey

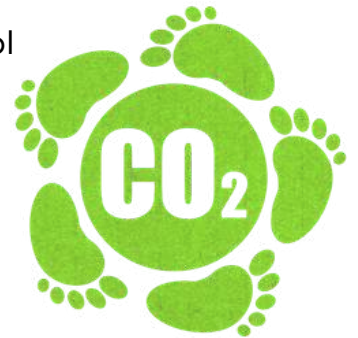
- Students keep a travel journal for a week, recording how they travel to school and to the school garden. They also design a short questionnaire for parents about their daily travel habits and transport choices.

## 2. Analysis of Routes to School and the Garden

- In groups, students draw a map of the route from school to the community or educational garden, marking safe and unsafe areas.
- They suggest improvements for safer walking and cycling paths.

## 3. Eco-Committee: To the Garden and School by Bike

- Students measure the distance from their home to school and calculate how much CO<sub>2</sub> they would save if they cycled instead of driving once a week.
- In the garden, they create a natural bike parking area using wood, plants, or other reused materials.
- Using seasonal ingredients found in the garden, students prepare a healthy garden snack together.



## 4. Visit to a Community or Educational Garden

- Students travel to the garden by public transport, bicycle, or on foot (depending on distance).
- Along the way, they record traffic data (counting bicycles, pedestrians, and cars).
- At the garden, they brainstorm ideas to improve accessibility and safety for cyclists and pedestrians.
- Optional activity: Garden Orienteering Challenge – On the way to the garden, students complete short tasks (e.g., identify a plant, measure the distance between two landmarks, count their steps to the next tree).



**Ages 12–14**



**Goal:** *Students think critically about sustainable mobility, carbon footprints and green transport. Using real data, they co-create and advocate for safe, accessible, and low-carbon routes to school and the garden.*

## 1. Calculating the Carbon Footprint

- Students use a CO<sub>2</sub> calculator to estimate the emissions generated by travelling to school and to the school garden. They then prepare an action plan to reduce the carbon footprint of their class and school. Students also calculate how many kilometres can be saved by using food grown in the school garden instead of imported products. For the calculations, they use examples of actual meals from the school kitchen.



## 2. Research Project: Sustainable Mobility in Our Community

- Students analyze traffic around the school and garden, identifying obstacles to sustainable mobility and proposing new solutions such as bike stands or safer routes. They create a route plan to the local market, mapping a green route for selling or exchanging garden produce. Their map includes the route, means of transport, packaging method, and sustainability notes.

## 3. Awareness Campaign: “Walk or Bike to the Garden”

- Students create a short awareness video to encourage peers and parents to walk, ride a bike, or use public transport instead of driving.
- They design posters, infographics, or videos that promote sustainable travel and link it to the garden (e.g. “If your lunch comes from the garden, let your journey be green too!”). Their campaign can be shared on the school website, social media, or notice boards.



## 4. Visit to a Community or Educational Garden

- Students travel to the garden by public transport, on foot, or by bicycle (depending on distance). In groups, they analyze the safety and accessibility of the route and prepare a short report with improvement ideas.
- They present their proposals to local authorities or the school community, raising awareness about greener mobility options for everyone.

# Module 5: Sustainable Mobility - LEARNING EXPERIENCES

## Ages 6–8

### Green Steps to the Garden

- Worksheet
- Ways of traveling to school (walking, cycling, by car, etc.)
- Group discussion



## Ages 6–11

### Creative Workshop – The Model project

- Group work
- Mapping routes around the school and the garden
- Creating a 3D model



## Ages 9–11

### Travel Journal

- Travel log sheet
- Recording travel methods (walking, cycling, car, etc.)
- Involving parents through questionnaires



## Ages 9–14

### Sustainable Mobility and Our Environmental Impact

- Worksheet
- Calculating the carbon footprint
- Creating an awareness-raising poster



### On the Way to the Community Learning Garden

- Visit to a community learning garden
- Worksheet
- Observing and documenting the route





# Green Steps to the Garden

## TEACHER PREPARATION

1. Print one worksheet per student (preferably in color).
2. Ask students to bring colored pencils and regular pencils.
3. Before starting, have a short discussion about different ways to travel to the school or the garden (by bike, on foot, by car with parents, by bus, etc.).
4. On the board, draw a simple two-column table: Sustainable Transport and Non-Sustainable Transport, and together with students, sort pictures or words into the correct category.



## STEP-BY-STEP GUIDE

1. **Introduction and Discussion:** Talk with students about how they usually get to school and how they could come in a more environmentally friendly way. Encourage reflection on why walking or cycling is healthy and good for the planet.
2. **Maze Activity:** Students help Ana and Nik find a safe walking path to the garden in a maze. Along the way, they encounter different means of transport, which provides an opportunity to discuss which ones are sustainable and which are less sustainable.
3. **Sorting Pictures:** In the second part of the worksheet, students circle the images that show sustainable forms of transport. They can also draw their favorite way to travel sustainably.
4. **Group Reflection and Consolidation:** Review the answers together. Ask guiding questions such as: *“How do you feel when you walk or cycle? Why is this good for the environment? What could we change so that more of us could travel on foot or by bike?”*





## REFLECTION QUESTIONS

1. Why is walking good for your body and health?
2. Do you notice more things when walking or cycling than when riding in a car?
3. How could we make the path to the garden safer for children?
4. Which means of transport is the most environmentally friendly?

## EXTENSION ACTIVITIES

1. Students draw their favorite means of transport.
2. Organize a “Walking Bus” or a “Bike to School Day.”
3. Create a class poster with children’s drawings: “On a Sustainable Journey to School or the Garden.”
4. Role-play activity: students act as cyclists, pedestrians, or drivers and discuss the advantages and risks of each.



# GREEN STEPS TO THE GARDEN

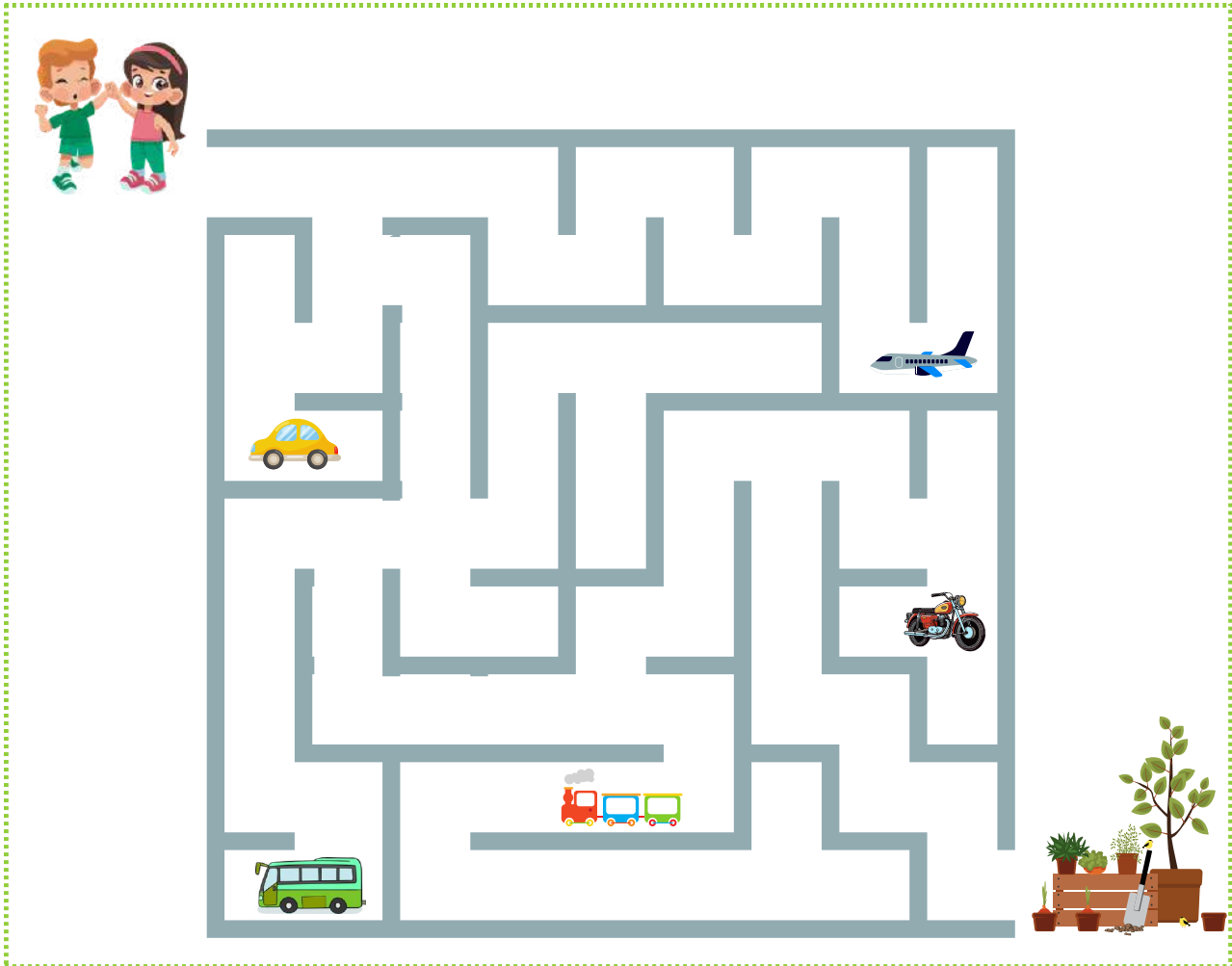
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CLASS:

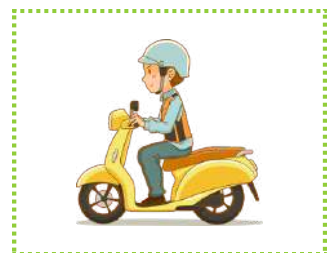
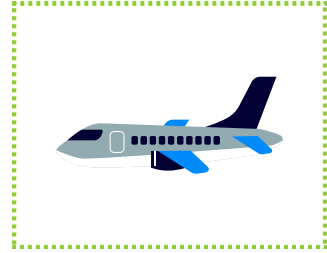
DATE:



HELP ANA AND NIK FIND A SAFE WALKING ROUTE TO THE SCHOOL GARDEN.



CIRCLE THE PICTURES THAT SHOW SUSTAINABLE WAYS OF GETTING AROUND.





# Creative Workshop: The Model Project

## TEACHER PREPARATION

1. Prepare a basic floor plan of the school grounds or the school garden area (A3 or A2 format).
2. Gather materials for building the model: milk cartons, colored or crepe paper, paper rolls, bottle caps, fabric scraps, modeling clay, cardboard, natural materials (twigs, leaves, stones), glue, scissors, markers, and paints.
3. Introduce students to the basic principles of sustainable mobility and the importance of walking, cycling, and green spaces for health and the environment.
4. Take a walk around the school area – have students observe where walking paths could be improved, bike racks installed, or more greenery planted.

## STEP-BY-STEP GUIDE

1. **Introduction and Motivation:** Discuss how students usually get to school, which routes they use, what they notice on the way, and what could be improved in terms of safety.
2. **Planning:** Divide students into groups. Each group (or individual, if preferred) designs a plan for traffic routes around the school and garden. Their model should include: Walking routes and safe pedestrian crossings, bike racks, green areas and trees, street furniture such as benches, fountains, and bins.
3. **Model Creation:** Students build three-dimensional models using the provided materials. Encourage them to reuse materials creatively and think about the placement of each element – safety, accessibility, and environmental benefit.
4. **Presentation:** Each group presents their model and explains how it supports sustainable mobility and improves the school environment.





## REFLECTION QUESTIONS

1. Which routes around the school are the safest for walking or cycling?
2. Where would it be best to add bike racks or more greenery?
3. Why is it important to have green areas and less car traffic near schools?
4. How could your model inspire real-world changes for a more sustainable school environment?

## EXTENSION ACTIVITIES

1. Invite parents or local decision makers to a model exhibition, where students can present their ideas.
2. Based on the models, prepare a class recommendation letter to the local municipality with suggestions for safer and greener routes around the school.
3. Hold a class vote to choose the most inspiring model – discuss which ideas could realistically be implemented.





# Travel Journal

## TEACHER PREPARATION

1. Prepare a Travel Journal template for students (a 5–7 day table where they record how they travelled to school or to the school garden – walking, cycling, scooter, car, or public transport) or use the provided one.
2. Together with the students, create a simple questionnaire for parents about their daily travel habits, transport choices, reasons for choosing certain modes, and opinions on sustainable mobility.
3. Encourage students to discuss the questions at home before filling out the questionnaire with their parents.

## STEP-BY-STEP GUIDE

1. **Introduction and Discussion:** Talk with students about different ways of travelling to school and how each type of transport affects health and the environment. Ask them to describe their typical journey to school.
2. **Travel Journal:** Students keep a travel journal for one week, recording their mode of transport each day and the distance from home to school. They may notice differences in distance depending on the transport mode used.
3. **Parent Questionnaire:** Each student takes home a short questionnaire to fill in together with their parents. Back in class, students and the teacher analyze the results together – e.g., how many families drive, how many use public transport, or walk.
4. **Analysis and Discussion:** Students compare their own journals and their parents' travel habits. Together, they reflect on how their daily school journeys could become more sustainable.





## REFLECTION QUESTIONS

1. How many times a week do you walk or cycle to school?
2. Why do your parents drive you to school?
3. How could you travel to school in a more sustainable way more often?
4. What do your parents think – could you change something together?

## EXTENSION ACTIVITIES

1. Create a class poster with shared results (e.g., a graph showing how many students walk to school).
2. Encourage students to set a personal goal (e.g., “I will walk to school twice a week”).
3. Organize a Car-Free Day or a Sustainable Mobility Week.

## NOTES FOR TEACHERS

### PARENT QUESTIONNAIRE

Before beginning, clearly explain the goal: “*We are going to create a questionnaire for our parents about their daily travel habits and how they get to work or school.*” Ask students what they would like to know – write their suggestions on the board. Group similar ideas and select 8–10 short, clear questions, mostly closed-ended (YES/NO, a/b/c choices) and one open-ended question for comments. Ensure the questionnaire is anonymous and easy to understand for children.

#### Possible Question Ideas:

What is your most frequent mode of transport?

How often do you use sustainable transport (walking, cycling, public transport)?

What is your average daily travel distance?

How safe do you feel on your route?

# TRAVEL JOURNAL

## WORKSHEET

NAME:

CLASS:

DATE:



For one week, keep track of **your journey from home to school**. Write down the day, how you travelled, whether you were alone or with someone, how long it took, the approximate distance, and any special observations.

DAY	HOW I CAME TO SCHOOL	WAS I ALONE OR WITH SOMEONE (WHO?)	TRAVEL TIME	DISTANCE	SPECIAL NOTES
Wednesday	by car	with parents	7 minutes	2.5 km	lots of red lights on the way
MONDAY					
TUESDAY					
WEDNESDAY					
THURSDAY					
FRIDAY					

On FRIDAY, answer the questions below:

1. Which mode of transport did you use most often this week?
2. Which way of travelling did you like the most? Why?
3. What did you notice on your way to school (for example, trees, animals, other children)?
4. What could be changed to make the way to school safer and more enjoyable?





# Sustainable Mobility and Our Impact on the Environment

## TEACHER PREPARATION

1. Print the worksheet “*Sustainable Mobility and Our Impact on the Environment*” for each student.
2. Prepare an interactive introduction – for example, a short video clip or a photo showing a traffic jam or bike lanes.
3. Write key terms on the board: sustainable mobility, CO<sub>2</sub>, transport, carbon footprint.
4. Prepare a local map marking the school, students’ homes, and possible routes (walking, cycling, bus).
5. Provide pencils and coloured pens.

## STEP-BY-STEP GUIDE

1. Start with a discussion about what sustainable mobility means and why it matters. Talk about how our daily travel choices affect air quality and the environment.
2. Students complete the worksheet independently or in pairs. Encourage them to think critically about their own travel habits and the environmental impact of different transport modes.
3. At the end, review the answers together. Compare the results, highlight interesting ideas, and reflect on how everyday habits could become more sustainable.
4. Pay special attention to questions 8 and 10 – collect students’ ideas on a shared class poster. Decorate it with drawings or magazine clippings related to transport (students can bring the pictures from home).





## REFLECTION QUESTIONS

1. How do you usually travel to school, and could you do it in a more sustainable way?
2. Why is it important to reduce car use?
3. Which means of transport are best for short journeys, and why?

## EXTENSION ACTIVITIES

1. Students design school posters with their own sustainability slogans.
2. Organize a class challenge such as a “Car-Free Week” or a “Walk-to-School Bus.”
3. Host a class debate: “*Should students walk or cycle to school?*”
4. Students create a comic strip or short story about a “sustainability hero” travelling to school.



Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Sustainable Mobility and Our Impact on the Environment



## 1. Circle the correct answer.



**What is the main goal of sustainable mobility?**

- a) To get to your destination faster, even if it uses more fuel.
- b) To use transport options that produce as little CO<sub>2</sub> emissions as possible.
- c) To buy the latest electric vehicle.
- d) To travel only abroad because local trips are not sustainable.



**Which means of transport is most sustainable for a daily trip to the school garden?**

- a) Car (diesel).
- b) Bicycle.
- c) Motorbike.
- d) Taxi.



**Which is NOT an advantage of an efficient low-carbon transport system?**

- a) Saving time and money.
- b) Reducing pollution.
- c) Greater dependence on fossil fuels.
- d) Better health.

## 2. List at least four benefits of an efficient low-carbon transport system.



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**3. Match the MEANS OF TRANSPORT with their environmental impact**  
(in grams of CO<sub>2</sub> per person per kilometre).



MEANS OF TRANSPORT	CO <sub>2</sub> EMISSIONS (G/KM)
CAR	280 g
BUS	4 g
PLANE	19 g
BICYCLE	87 g
WALKING	17 g
TRAIN	6 g
ELECTRIC CAR	50 g
MOTORBIKE	150 g

**4. Complete the sentence.**



By carpooling (sharing a car with 4 people), greenhouse gas emissions are reduced by \_\_\_\_\_ %.

**5. True or False (circle the correct answer)**



- a) Transport in Europe produces more than half of all greenhouse gas emissions. TRUE / FALSE
- b) Flying causes fewer emissions than driving a car. TRUE / FALSE
- c) Electric vehicles have no environmental impact. TRUE / FALSE

## 6. Think and answer.

Imagine your class is visiting a community learning garden. How could you get there in a sustainable way? (e.g., by public transport, walking, or cycling)



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## 7. Rank the transport modes from MOST (1) to LEAST (4) sustainable.



## 8. Create a slogan!

Write a short slogan for a campaign that would encourage your classmates to travel to school in a sustainable way.



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## ANSWER KEY SUMMARY

- 1.: b, b, c  
2.: Saving time and money, better access, energy security, less pollution, better health  
3.: car – 150 g, bus – 19 g, plane – 280 g, bicycle – 6 g, walking – 4 g, train – 17 g, electric car – 50 g, motorbike – 87 g  
4.: 75 %  
5: a) false, b) false, c) false  
6.: Public transport, walking, cycling ...  
7.: 3, 1, 2, 4  
8.: Students' own answers



# On the Way to the Community Learning Garden

## TEACHER PREPARATION

1. Check the route to the community learning garden in advance. Mark key points (e.g., bus stop, bridge, park, crossroads) and assess safety aspects.
2. Print a worksheet for each student.
3. Remind students to bring pencils, clipboards, and coloured pens or markers for observations during the trip.
4. Before the outing, talk with students about road safety, responsible behaviour in public spaces, and how to walk safely as a group.
5. At the garden, prepare a suitable space for the final discussion and creative activity.

## STEP-BY-STEP GUIDE

1. **Before departure:** In the classroom, discuss which modes of transport students usually use. Encourage them to reflect on why some are more sustainable than others.
2. **During the journey:** Students observe both traffic and natural elements along the way (signs, traffic lights, trees, birds...). They identify safe and less safe parts of the route and discuss them with the teacher or classmates.
3. **At the garden:** Students complete the worksheet based on their observations. They also record the gardening activities they take part in (e.g., planting, watering, observing insects) and reflect on how they could reduce waste in the garden (for example, composting, reusing pots, collecting food scraps).
4. **Conclusion:** Each student draws or describes how they would design the route from the bus stop to the garden to make it safe and sustainable for everyone – pedestrians, cyclists, and animals. This part can be completed at the garden or later in class.



## REFLECTION QUESTIONS

1. Which parts of the route did you find pleasant and safe? Why?
2. What could be improved to make the route safer?
3. How can a garden visit inspire more sustainable habits in everyday life?

## EXTENSION ACTIVITIES

1. Students design a pictogram for a traffic sign that promotes safer routes for children.
2. Students write a short letter to the local community or their parents, describing the route and suggesting improvements for sustainable mobility.
3. Take photos or short videos of the walk from school to the garden and create a photo journal or short film documenting the sustainable journey.



Name: \_\_\_\_\_

Date: \_\_\_\_\_

# On the Way to the Community Learning Garden



1. Circle what you used today to get to the garden:

- a) bus
- b) car
- c) walking
- d) bicycle



2. Answer: Why is taking the bus more sustainable than driving a car?



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3. Think back to your route from the bus stop to the garden.

Tick what you passed along the way, ✓

a bridge over the main road

a park

a forest

a river

a gravel path

a pedestrian crossing

Which two parts of the route did you feel were safest, and why?



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Which two parts of the route felt least safe? What could be done to make them safer?



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Tick what you noticed on the way: ✓

car

meadow

pedestrians

cycle path

crossroads

traffic lights

litter bin

birds

trees

What could be added along the route to make it more pedestrian- and cyclist-friendly?

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**4. What activities did you do today at the Community Learning Garden? List at least five activities.**



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How can you help reduce waste in the garden?



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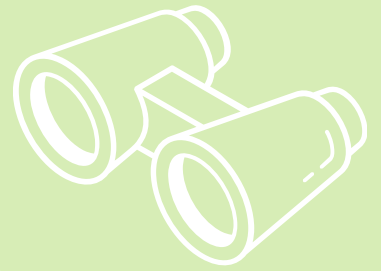
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## Further Exploration



- **Urban school garden, a teacher's guide**
- **Gardening Etiquette**
- **Gardening Journal**
- **Cars, planes, trains:** where do CO2 emissions from transport come from?
- *How our daily travel harms the planet*
- **Climate change:** Should you fly, drive or take the train?
- **What is sustainable transport** and what role does it play in tackling climate change
- **Sustainable transport**



A hand is shown holding a glowing lightbulb. Inside the lightbulb, there are solar panels, symbolizing energy. The background is dark blue.

## MODULE 6

# *Energy*

Energy is all around us – we find it in the sun, wind, water and even in food. In the school garden, students explore how to recognize natural sources of energy, how to use them in everyday life and why it is important to use energy wisely. Through creative, hands-on activities, they discover the connections between natural resources and a sustainable lifestyle while developing a respectful and responsible attitude towards the environment.

## Keywords

Environmental studies, science and technology, natural sciences, biology, home economics, visual arts, mathematics, renewable energy sources, greenhouse, water flow, solar cooker, turbine, windmill, biomass, wind, water, sun, experiment, model, creation, ages 6–8, ages 9–11, ages 12–14

## Guidelines

The school garden, as an outdoor classroom, offers a hands-on opportunity to explore different sources of energy. The focus is on understanding renewable energy sources (sun, wind, water) and recognizing the importance of using energy efficiently and responsibly. Natural energy sources are free but precious – when used wisely, they help us save energy, protect nature, and create innovative solutions. By discovering how energy works in nature, students strengthen their environmental responsibility and develop as creative young researchers.

### 1. Connect energy to the school garden

- Encourage students to think about their own energy use (at home and at school) and explore ways to reduce it through sustainable solutions.
- Discuss how energy is used and produced in the school garden.

### 2. Highlight the importance of sustainable living

- Through hands-on activities, help students connect everyday habits (turning off lights, walking instead of driving, saving water) to sustainable lifestyles.

### 3. Explore different energy sources

- Use age-appropriate experiments and investigations to introduce various sources of energy. Have students compare their benefits and environmental impacts.

### 4. Think and create

- Students design simple or more complex energy-based solutions (e.g., a solar lamp, a geometric model, a small windmill).
- They suggest ways to reduce energy use in the school garden and promote renewable practices in everyday life.



# Objectives

- **Students identify and understand** different natural sources of energy (sun, wind, water) and their importance for life and the environment.
- **Students develop awareness** of the benefits of renewable energy and the environmental impact of fossil fuels.
- **Students explore** the connections between energy, plants, photosynthesis, and food chains.
- **Students design and build** simple or more complex models that use natural energy sources (e.g., a solar cooker, a wind turbine).
- **Students develop creativity and manual skills** through the use of recycled and sustainable materials.
- **Students observe, measure, record, and present** their findings.
- **Students analyze** energy consumption in their surroundings and suggest actions to reduce their carbon footprint.
- **Students strengthen their environmental awareness** and actively participate in projects that promote sustainable energy use at the school and local community.



# Activities

**Ages 6–8**



**Goal:** Through observation, creation, and play, students identify different sources of energy (sun, wind, water, food), develop curiosity for exploration, and understand the basic effects of energy in the natural environment.

## 1. Catch the Wind and Sun

- Students make colorful wind and sun catchers using recycled materials (plastic bag strips, foil, string). They hang them in the school garden and observe how they move in the wind and shimmer in the sunlight. Afterwards, they discuss their observations and draw what they observed.



## 2. My Little Greenhouse

- Students build a mini greenhouse using cardboard and a transparent bag. They sow beans or other seeds inside, place the greenhouses in different locations, and observe how the plants grow in different conditions.

## 3. Water Flow in a Channel

- In small groups, students design a simple water channel using plastic bottles, wooden planks, aluminium foil, or natural materials.
- They pour water into the channel and observe how gravity makes it flow. They test which light objects (leaves, bottle caps) move faster or slower and record their findings.



## 4. Game: Energy Pairs in Motion

- Students are given cards with pairs: energy source ↔ effect/use (e.g., sun ↔ plant growth, wind ↔ windmill, electricity ↔ light bulb). Each student finds their matching partner. Pairs then present their energy connection using mime, movement, or sound.





## Ages 9–11

**Goal:** *Students explore different sources of energy, analyze their impact on the environment, and create simple functional models. The focus is on linking theory with practice and developing skills for sustainable action.*

### 1. Solar Cooker

- Students build a solar cooker using a recycled cardboard box, aluminium foil, and transparent film.
- They place a piece of chocolate inside, measure the time it takes to melt, and compare the results.

### 2. Windmill

- Students make a windmill from paper or plastic. They record the number of rotations and observe how wind speed and position affect its movement.

### 3. Mini Water Turbine

- Students construct a simple water turbine using plastic bottles, straws, spoons, and wooden sticks. They observe the rotation of the blades and discuss how moving water can generate motion and energy.

### 4. Colorful Celery Experiment

- Students cut celery stalks and place them in cups of water dyed with different food colorings. They observe and record how the color travels up through the plant's veins after a few hours.
- They link this experiment to the movement of water through plants and the importance of photosynthesis.



**Ages 12–14**



**Goal:** *Students analyze the energy challenges of the modern world, evaluate sustainable solutions, and develop innovative ideas for using renewable energy sources in the school garden and the local community.*

## 1. Solar Lamp from a Recycled Electronic Candle

- Students disassemble an old solar memorial candle and identify its components.
- They check whether the battery can be recharged and reuse the lamp to light the school garden. Optionally, they redesign and place the lamp into a new housing.



## 2. Wind Turbine

- Using recycled plastic bottles, wooden sticks, and other reused materials, students build a mini wind turbine. They connect it to an LED light or a small fan and test how much power it can generate.

## 3. Biomass and Heat

- Students collect organic waste materials (grass, leaves) and use them as insulation for a mini greenhouse.
- They measure the temperature inside and outside using thermometers, compare the results, and discuss how decomposing releases heat through microbial activity.

## 4. Designing a Sustainable and Energy-Efficient School Garden

- Students analyze energy consumption in their school (lighting, heating, garden irrigation).
- They design practical measures to reduce energy consumption and incorporate renewable sources (e.g., rainwater collectors, solar lights, wind spinners).
- Finally, they present their proposals as a poster, a digital presentation, or a model.



# Module 6: Energy - LEARNING EXPERIENCES

## Ages 6–8



### Wind and Sun Catcher

- Crafting
- Photo documentation
- Worksheet

### My Mini Greenhouse

- Crafting
- Growth diary
- Plant observation

### Energy Pairs in Motion

- Outdoor game
- Matching cards
- Coloring sheet

### Water Flow in a Channel

- Construction activity
- Photo documentation
- Worksheet



## Ages 9–11



### Solar Cooker

- Crafting
- Solar energy experiment
- Worksheet

### Windmill

- Crafting
- Experiment
- Worksheet

### Colorful Celery Stalk Experiment

- Experiment
- Water movement in plants
- Worksheet



**Ages 12-14**



**Wind Turbine**

- Construction project
- Observation and data recording
- Worksheet

**Geothermal Energy – Earth’s Heat**

- Experiment
- Temperature measurement
- Worksheet

**Designing a Sustainable, Energy-Efficient School Garden**

- Creative project
- Group work
- Worksheet





# Wind and Sun Catcher

## TEACHER PREPARATION

1. Prepare materials for making wind and sun catchers:
  - A ring cut from a plastic bottle (2–3 cm high)
  - Strips cut from leftover plastic bags, gift ribbons, or packaging foil
  - Shiny elements: reflective/aluminium foil, metallic or colored paper
  - Wool or string (for decoration and hanging)
  - Scissors, glue (glue stick or white glue), hole punch
  - Long string for hanging
  - Illustrated step-by-step guide and observation worksheet
2. Find suitable spots in the school garden or playground where the catchers can be hung (tree branches, pergola, fence).
3. Prepare a sample catcher to show students before starting.

## STEP-BY-STEP GUIDE

1. **Introduction:** Start with a short discussion: “*What can the wind move? What shines in the sun?*” Show pictures or short videos of wind in motion, shiny objects, and rustling leaves. Announce: “*Today, we will make Wind and Sun Catchers using recycled materials.*”
2. **Planning the Design:** Students draw a simple plan of their catcher (ring + strips). They think about which materials will move easily in the wind and which will sparkle in the sunlight. Each student decides where to hang their catcher in the garden.
3. **Making the Catcher:** Students decorate the plastic ring with wool or colored paper. They cut 30–40 cm long and 1–2 cm wide strips from different materials and glue shiny pieces on them. The strips are attached to the inside edge of the ring. Use a hole punch to make three small holes and tie the string for hanging.
4. **Hanging and Observation:** Students hang their catchers in selected spots around the garden. They observe how the strips move and shine under different weather conditions. Finally, they draw or mark their observations on the worksheet.



## REFLECTION QUESTIONS

1. Does the wind always blow? Why do things move?
2. Can you see any connection between the weather and how your catcher moves?
3. Do you know words that describe movement (flutter, sway, tremble) and light (shine, sparkle, reflect)?

## EXTENSION ACTIVITIES

1. Add name tags or picture stickers so children can recognize their own wind catchers.
2. Outdoor Gallery: Display the catchers as an art installation around the school garden.
3. Wind Experiment: Hang catchers in different spots (windy vs. sheltered) and compare what happens.
4. Place two catchers – one in a calm area and one in a windy area – and observe the differences.

## NOTES FOR TEACHERS

Encourage the use of contrasting colors, varied materials, and symmetry in the designs. During observation, introduce key scientific concepts such as wind, movement, light reflection, and natural energy sources.

### Weather Observation Guide:

- If it's windy → the strips move or flutter.
- If there's no wind → the strips remain mostly still.
- If it's sunny → shiny parts reflect and sparkle brightly.
- If it's cloudy → the reflections are dim or not visible.



# WIND AND SUN CATCHER

VISUAL MATERIALS FOR THE  
ACTIVITY



WIND



SUN



TREE



SHINY FOIL



CHILDREN IN THE GARDEN

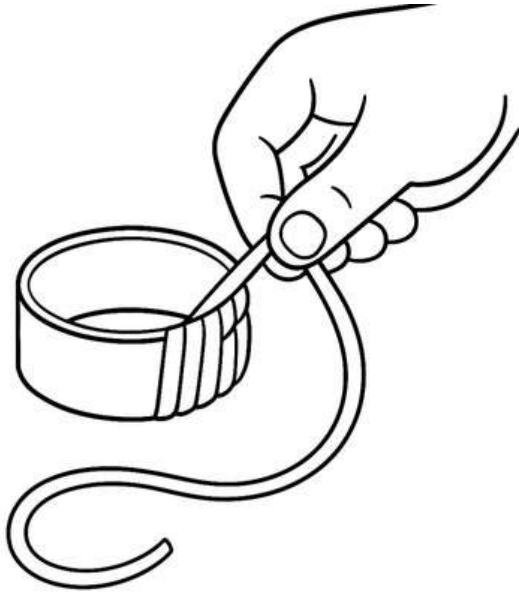
# WIND AND SUN CATCHER



## INSTRUCTIONS FOR STUDENTS

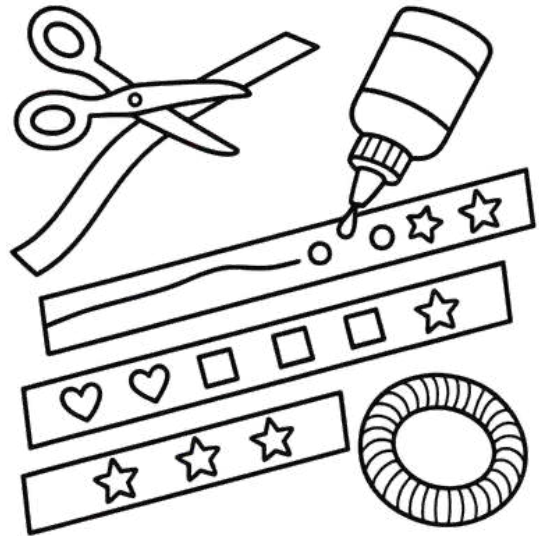
1.

DECORATE THE RING WITH  
YARN OR COLORED PAPER.



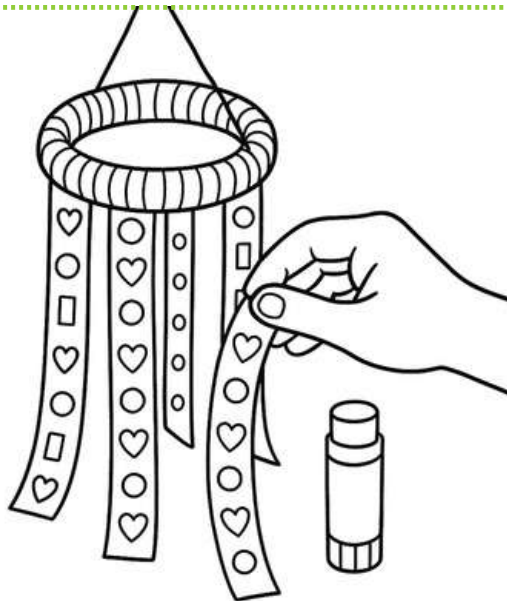
2.

CUT STRIPS AND DECORATE  
THEM WITH SHINY MATERIALS.



3.

GLUE THE STRIPS TO THE INSIDE  
OF THE RING. ADD A STRING TO  
HANG IT UP.



4.

HANG YOUR CATCHER IN A SAFE  
SPOT AND OBSERVE IT.



# WIND AND SUN CATCHER

NAME:

CLASS:

DATE:



**COLOR THE PICTURE THAT SHOWS TODAY'S WEATHER.**



SUNNY



CLOUDY



STRONG WIND



LIGHT WIND



NO WIND



**CIRCLE WHAT YOU NOTICED:**

**RIBBONS:** ● FLUTTER ● STAY STILL ● MOVE SLIGHTLY

**SHINY PARTS:** ● SHINE BRIGHTLY ● SHINE A LITTLE ● NO SHINE

**DRAW YOUR WIND AND SUN CATCHER AND SHOW HOW IT MOVES OR SHINES IN THE WIND AND SUN:**



**MARK WHAT YOU HAVE LEARNED:**

- WIND MAKES THINGS MOVE. ✓
- THE SUN MAKES THINGS SHINE.
- I CAN REUSE WASTE MATERIALS.
- NATURAL ENERGY IS ALL AROUND US.
- OTHER:



# My Little Greenhouse

## TEACHER PREPARATION

1. Prepare the following materials for each student:
  - Cardboard or thick A4 paper (as the base of the house)
  - Plastic bag (zip-lock or regular)
  - Cotton wool or paper towel
  - 2 seeds (bean, pea, or sunflower)
  - Glue, transparent adhesive tape, scissors
  - Markers or colored pencils for decoration
  - A shared spray bottle for watering
  - Growth observation sheet (growth diary)
2. Prepare a sample greenhouse with a plastic bag and seeds to show students.
3. Find a bright place in the classroom or hallway where students can hang their greenhouses.



## STEP-BY-STEP GUIDE

1. **Introduction:** Start a discussion: “*What does a plant need to grow? (water, warmth, light, air).*” Show pictures of germination and greenhouses. Explain that the class will make small greenhouses.
2. **Building the Greenhouse:** Students cut out a house shape and a window from cardboard. They color and decorate the house. Then, they prepare the plastic bag: place cotton inside, add the seeds, and lightly spray with water. Attach the bag to the back of the house with tape – leave the top of the bag open so that air can circulate and the seeds don’t rot. Students write their name and the date of planting on the house.
3. **Observation:** Hang the mini greenhouses in a bright spot. Students observe the changes every day or every few days and draw what they see in their growth journal. Compare which seeds germinate faster and discuss





## REFLECTION QUESTIONS

1. What is the difference between plants growing in a greenhouse and plants growing in the garden?
2. What happens if a plant doesn't get enough light?

## EXTENSION ACTIVITIES

1. Growth Comparison: Hang some greenhouses in the sun and some in the shade – compare the growth results.
2. Transplanting: When the seedlings grow their first leaves, students transplant them into pots or the school garden.

## NOTES FOR TEACHERS

Use beans or cress (cress is ideal for younger students – fast germination and small seeds). For faster germination, soak bean seeds in water for a few hours before planting. Students should regularly check and maintain moisture using the spray bottle. Encourage students to record their observations with drawings and simple notes in their notebooks or mini “growth journals,” which can be attached to the cardboard greenhouse with a string.



# MY LITTLE GREENHOUSE

VISUAL MATERIALS



GERMINATION OF A PEA SEED



PLANTS IN THE SHADE: ROCKET



PLANTS IN THE SUN: BELL PEPPER



GARDEN GREENHOUSE



DIY MINI GREENHOUSE

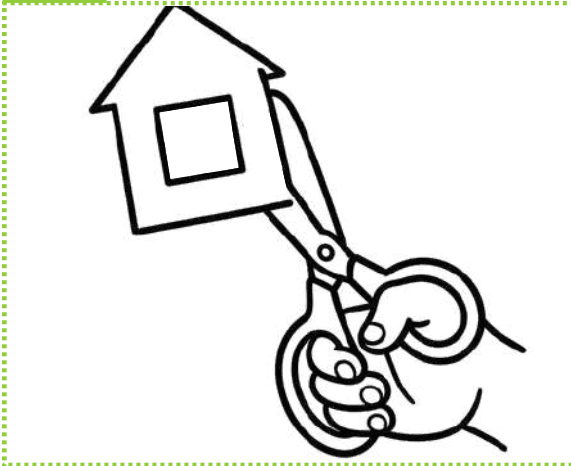


# MY LITTLE GREENHOUSE

## INSTRUCTIONS FOR STUDENTS

1.

ON CARDBOARD, DRAW A HOUSE SHAPE AND CUT IT OUT. CUT OUT A WINDOW.



2.

COLOR AND DECORATE YOUR GREENHOUSE.



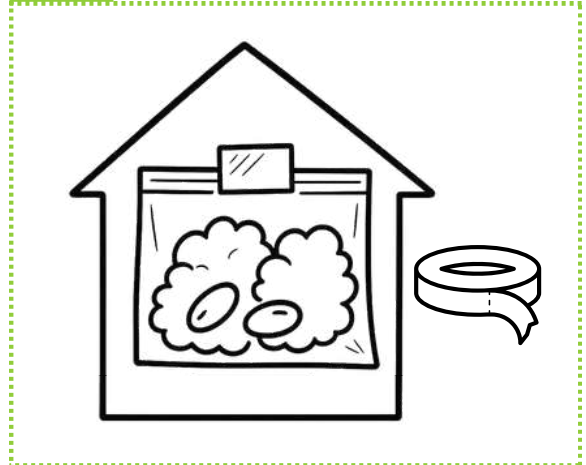
3.

PUT COTTON AND SEEDS INTO THE PLASTIC BAG. MOISTEN THE COTTON WITH WATER.



4.

ATTACH THE BAG TO THE BACK OF YOUR GREENHOUSE.



5.

WRITE YOUR NAME AND THE PLANTING DATE.



6.

HANG YOUR GREENHOUSE IN A BRIGHT SPOT.



EXAMPLE OF A MINI GREENHOUSE

EVERY DAY, OBSERVE WHAT HAPPENS AND DRAW HOW YOUR PLANT IS GROWING IN YOUR JOURNAL.



CUT ALONG THE LINE



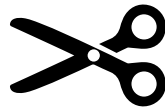
CUT ALONG THE LINE

**NAME:**

# MY GREENHOUSE



**PLANTING DATE:**



CUT ALONG THE LINE

# MY LITTLE GREENHOUSE

NAME:

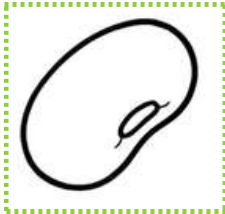
CLASS:

DATE:



## WHICH SEED DID YOU PLANT?

COLOR THE PICTURE OF THE SEED YOU PLANTED:



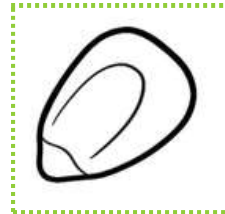
BEAN



PEA



SUNFLOWER



CORN



OTHER:

## WHERE DID YOU HANG YOUR GREENHOUSE?



.....

.....

.....

## DRAW YOUR GREENHOUSE.



## CHECK WHAT A PLANT NEEDS TO GROW:



WATER



WARMTH



LIGHT



AIR

OTHER:

.....



# GROWTH JOURNAL



NAME:

CLASS:



PHOTO OR  
DRAWING OF THE  
PLANT



## OBSERVATION – DAY 1

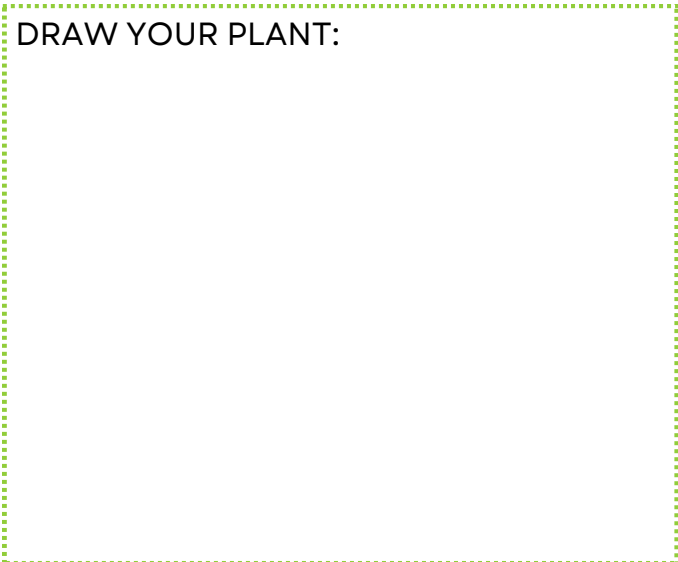
DATE:

WHAT DID I NOTICE TODAY?

.....

.....

DRAW YOUR PLANT:



## OBSERVATION – DAY 2

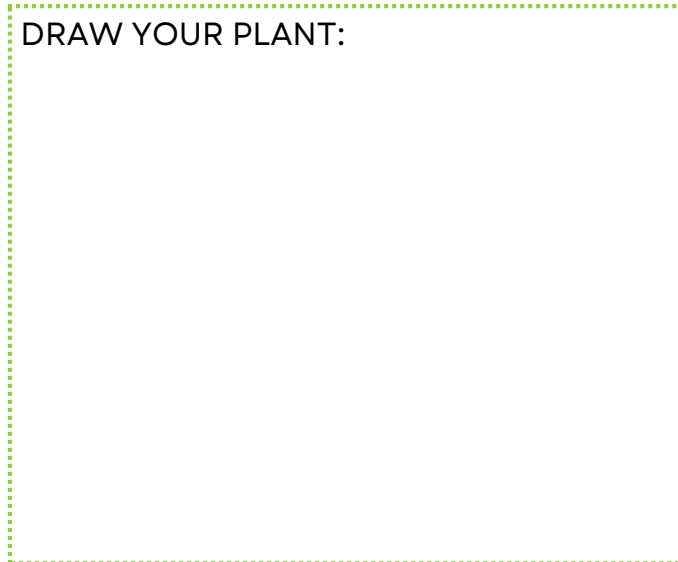
DATE:

WHAT DID I NOTICE TODAY?

.....

.....

DRAW YOUR PLANT:



## OBSERVATION – DAY 3

DATE:

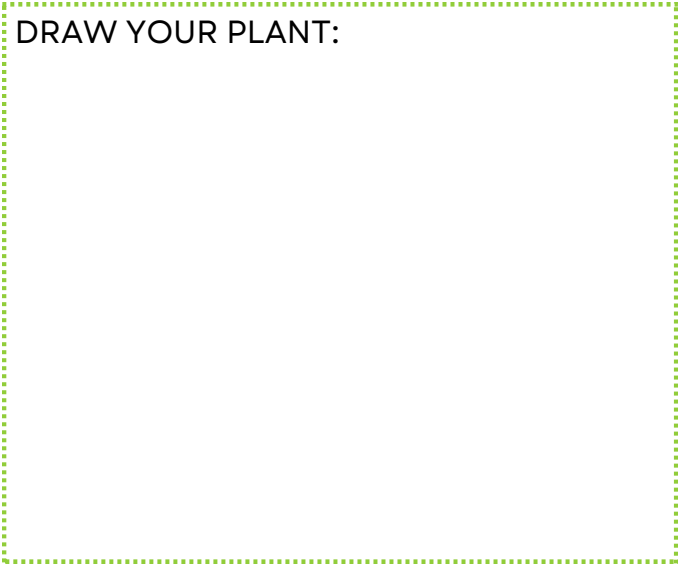
WHAT DID I NOTICE TODAY?

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DRAW YOUR PLANT:



## OBSERVATION – DAY 4

DATE:

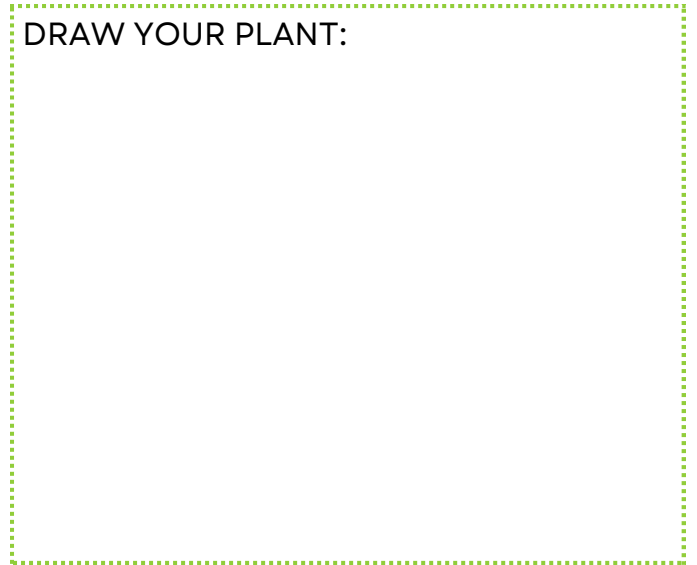
WHAT DID I NOTICE TODAY?

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DRAW YOUR PLANT:



## OBSERVATION – DAY 5

DATE:

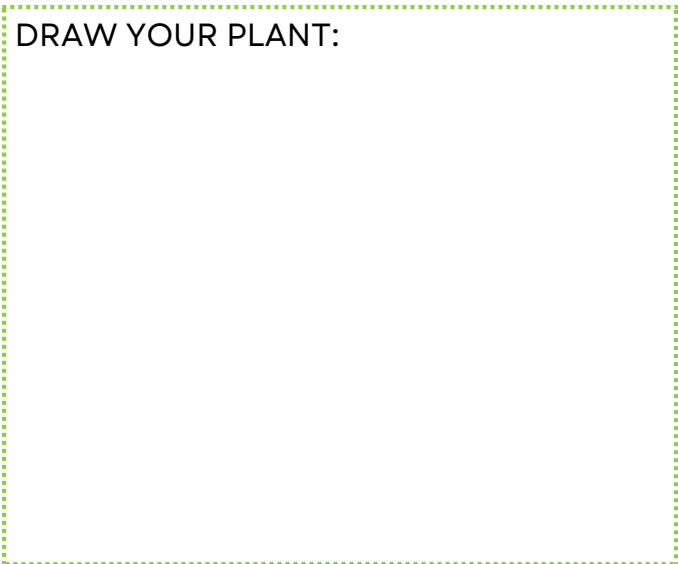
WHAT DID I NOTICE TODAY?

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DRAW YOUR PLANT:



## OBSERVATION – DAY 6

DATE:

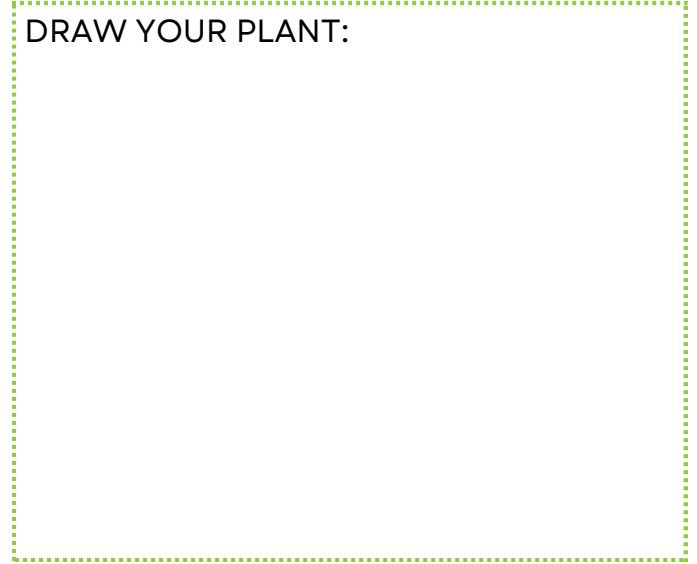
WHAT DID I NOTICE TODAY?

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DRAW YOUR PLANT:



## OBSERVATION – DAY 7

DATE:

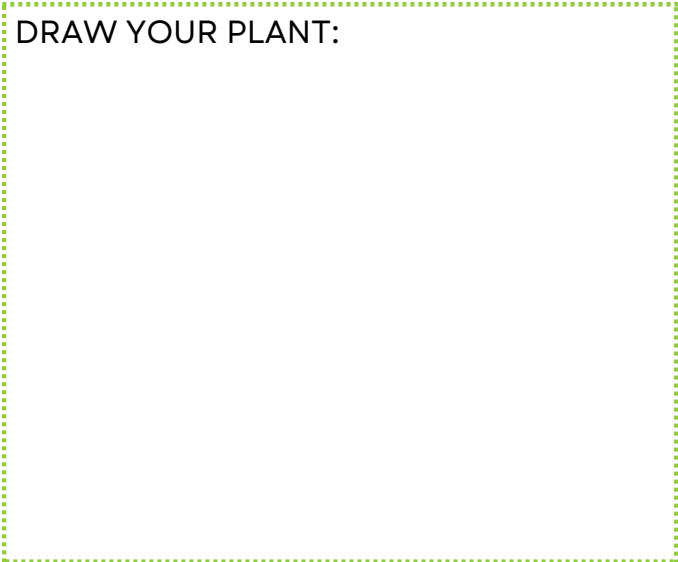
WHAT DID I NOTICE TODAY?

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DRAW YOUR PLANT:



## OBSERVATION – DAY 8

DATE:

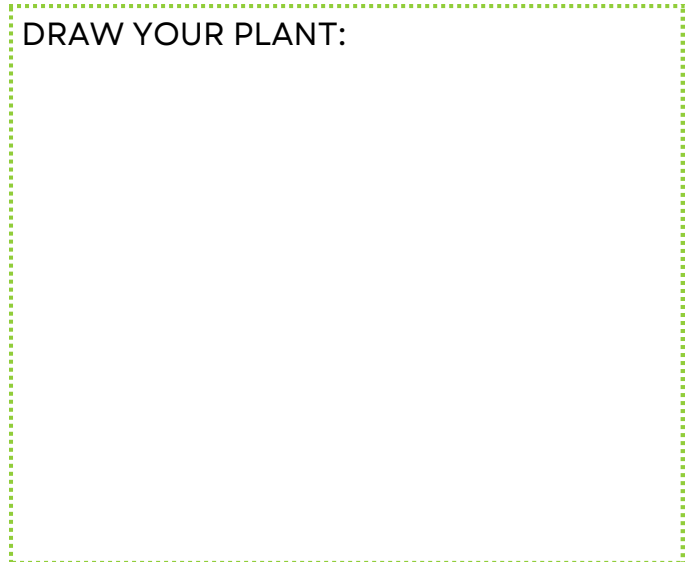
WHAT DID I NOTICE TODAY?

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DRAW YOUR PLANT:



## OBSERVATION – DAY 9

DATE:

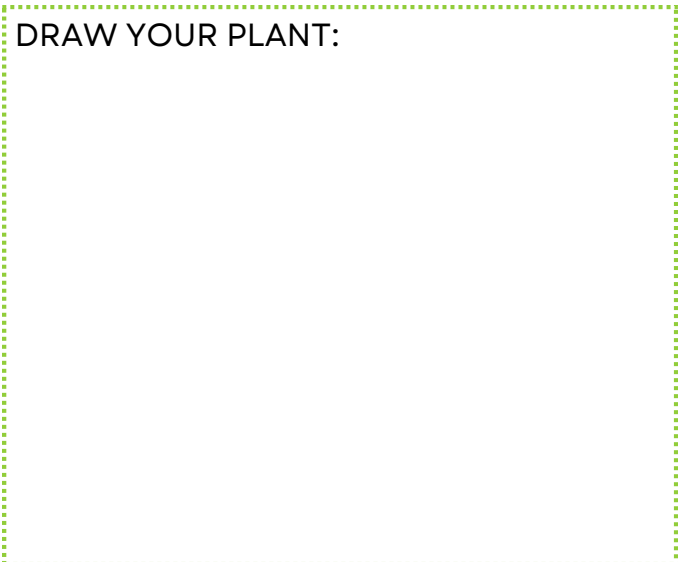
WHAT DID I NOTICE TODAY?

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DRAW YOUR PLANT:



## OBSERVATION – DAY 10

DATE:

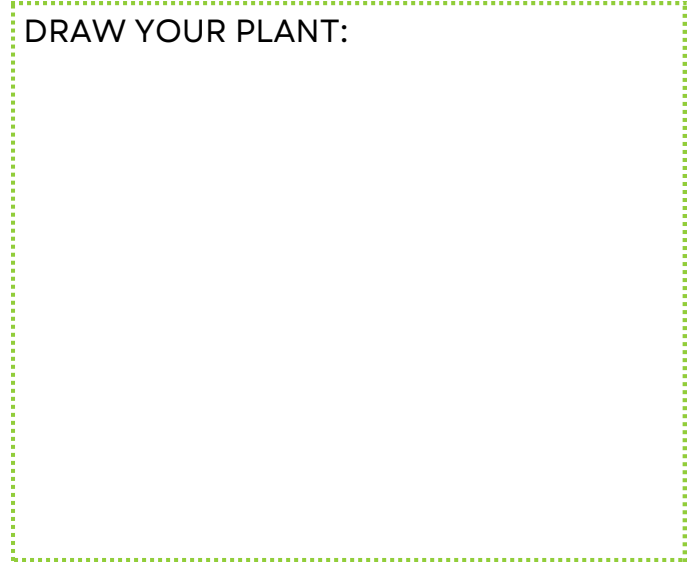
WHAT DID I NOTICE TODAY?

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DRAW YOUR PLANT:





# Game: Energy Pairs in Motion

## TEACHER PREPARATION

1. Prepare sets of paired cards (pictogram + simple label, suitable for younger pupils – ages 6–8).
2. Print or draw the cards on thick paper or laminate them for repeated use.
3. Instead of paper, you can use wooden tiles and transfer the images using glue (e.g., Mod Podge) or by engraving.
4. Prepare enough cards so that each pupil gets one (e.g., for 28 pupils, prepare 14 pairs).
5. Choose an open and safe play area – a playground, garden, or gym.
6. Prepare a visual instruction sheet showing examples of card pairs and the corresponding movements.



## STEP-BY-STEP GUIDE

1. **Distribute the cards:** Each pupil receives one card (without showing it to the others).
2. **Find your matching pair:** Pupils walk around and ask simple questions such as: “*What are you?*”, “*What do you do?*”, “*Who uses you?*”
3. When two pupils realize their cards belong together, they form a pair.
4. **Pair movement:** Each pair performs a short movement related to their energy source:
  - Sun + Plant → squat down and slowly rise up like a growing plant.
  - Wind + Windmill → run in a circle and wave arms like turbine blades.
  - Water + Mill → spin around together like a waterwheel.
  - Food + Movement → jump or spin in a short dance.





- 5. Group review:** When all pairs have been found, pupils group themselves by energy type (sun, water, wind, food, electricity...).
- 6. Repeat:** Shuffle and redistribute the cards for the next round.

## REFLECTION QUESTIONS

1. How are the sun and a plant connected?
2. Have you ever seen a water mill? What makes it move?

## EXTENSION ACTIVITIES

1. Time Challenge: Pupils try to find all pairs as quickly as possible.
2. Creative Challenge: Pupils design and illustrate their own energy cards for the next round.



# ENERGY CARD PAIRS



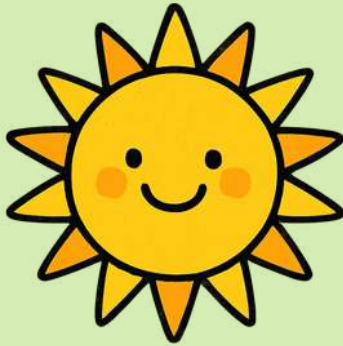
CARDS 1: ENERGY SOURCE	CARDS 2: EFFECT / USE	DESCRIPTION / EXPLANATION
SUN	BEAN PLANT GROWTH	Sunlight enables photosynthesis – essential for growth.
SUN	CLOTHES DRYING	The sun's heat dries wet clothes.
SUN	GREENHOUSE	Sunlight warms the greenhouse – heat supports plant growth.
WIND	FLAG FLUTTERING	Wind moves objects – mechanical energy.
WIND	WINDMILL SPINNING	Wind energy powers the windmill.
WATER (STREAM)	WATERWHEEL TURNING	Flowing water drives the wheel – mechanical energy.
WATER (WATERING CAN)	WATERING FLOWERS	Water helps plants grow – vital for life.
FOOD (APPLE)	HUMAN MOVEMENT	Food provides energy for the body.
FOOD	PLAY AND JOY	Food gives strength and well-being.
ELECTRICITY (PLUG / SOCKET)	LIGHTBULB GLOWING	Electricity produces light.
BATTERY	MOVING TOY ROBOT	Battery provides power to devices.
BATTERY	ELECTRIC SCOOTER	Battery powers the electric scooter.
WOOD (LOGS)	CAMPFIRE BURNING	Burning wood releases heat – thermal energy.
FIRE (STOVE)	COOKING (POT OVER FIRE)	Fire gives off heat energy used for cooking.
BODY (LEGS)	SWING MOTION	Body motion transfers energy to objects.



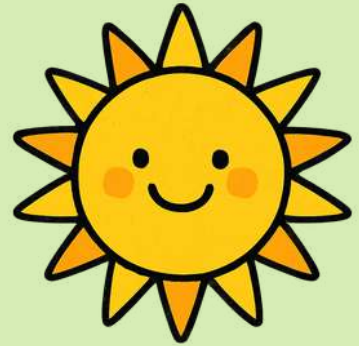
# SET 1: ENERGY SOURCES



SUN



SUN



SUN



WIND



WIND



WATER (STREAM)



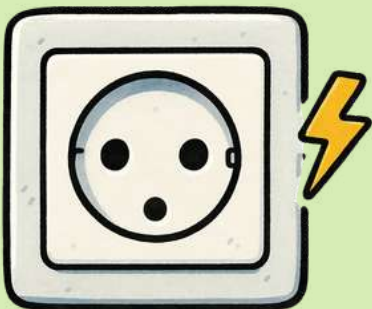
WATER (WATERING CAN)



FOOD (APPLE)



FOOD (APPLE)



ELECTRICITY



BATTERY



BATTERY



# CARDS 1: ENERGY SOURCES



WOOD (LOGS)



FIRE (STOVE FLAME)



HUMAN BODY (LEGS)

## COLORING PAGE



## SET 2: EFFECT / USE



BEAN PLANT GROWTH



CLOTHES DRYING



GREENHOUSE



FLAG FLUTTERING



WINDMILL SPINNING



WATERWHEEL SPINNING



FLOWERS GROWING



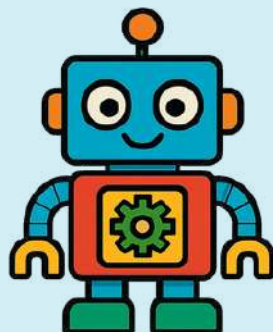
MOVEMENT



PLAY AND JOY



LIGHTBULB GLOWING



TOY ROBOT MOVING



ELECTRIC SCOOTER



## SET 2: EFFECT / USE



## COLORING PAGE





# Water Flow in a Channel

## TEACHER PREPARATION

1. Prepare the following materials for each group:
  - Cut plastic bottles (lengthwise) or aluminum foil (for the water channel)
  - Sticks, bricks, or wooden boards (to support the channel)
  - A container or plastic bottle with a small hole (to pour water steadily)
  - Light objects to observe water flow (leaves, corks, pinecones, flower petals, small pieces of styrofoam)
  - A ruler or measuring tape
  - A worksheet and colored pencils or markers
2. Find a suitable location – the school garden, a gentle concrete slope, or the playground.
3. Prepare a sample channel to show pupils what the result might look like.



## STEP-BY-STEP GUIDE

1. Start with a short discussion: “*What happens when we pour water on a slope? Why does it always flow downward?*” Show photos or a short video of a river, waterwheel, or gutter, and say: “*Today, we’ll make our own water channel and see how water moves objects.*”
2. **Planning:** Each group draws a simple plan of their channel (start, end, direction of flow). Students decide which objects to send down the water and mark the observation point for measuring results.
3. **Building and Testing the Channel:** Groups build their water channels using bottles or foil, support them with materials, and make sure the water stays inside. They pour water and observe how it flows, then let the objects travel down the channel. They note which objects reach the end and which get stuck.
4. **Observation and Recording:** On the worksheet, students draw their channel and the direction of the water flow. They mark which objects reached the end and which didn’t. Finally, they discuss which moved fastest and why.





## REFLECTION QUESTIONS

1. Which object moved the fastest? Why?
2. How can we make the water go faster?

## EXTENSION ACTIVITIES

1. Canal Race: Groups improve their designs and test which channel flows fastest.
2. Water Wheel Experiment: Build a simple mini waterwheel from a plastic bottle and see if flowing water makes it spin.

## NOTES FOR TEACHERS

Encourage students to experiment with different materials and compare results.

If the water doesn't flow well, suggest adjusting the slope or channel shape and assist with stabilizing the structure.

After the activity, lead a group reflection to discuss which materials worked best and why.

Highlight the connection between gravity and the movement of the water.



This activity is best conducted outdoors (on the school garden slope or playground) or students can even build their own ramp using materials found in the environment.



# WATER FLOW IN A CHANNEL

## VISUAL MATERIALS



WATER WHEEL



WATER SLIDE



RIVER



WATER PIPES



ROOF GUTTER



WATER PARK SLIDE



# WATER FLOW IN A CHANNEL

## INSTRUCTIONS FOR STUDENTS

1.

TODAY WE WILL EXPLORE HOW WATER FLOWS DOWN A SLOPE AND HOW IT MOVES THE OBJECTS.



2.

IN GROUPS, YOU WILL BUILD A WATER CHANNEL AND POUR WATER AND OBJECTS INTO IT.



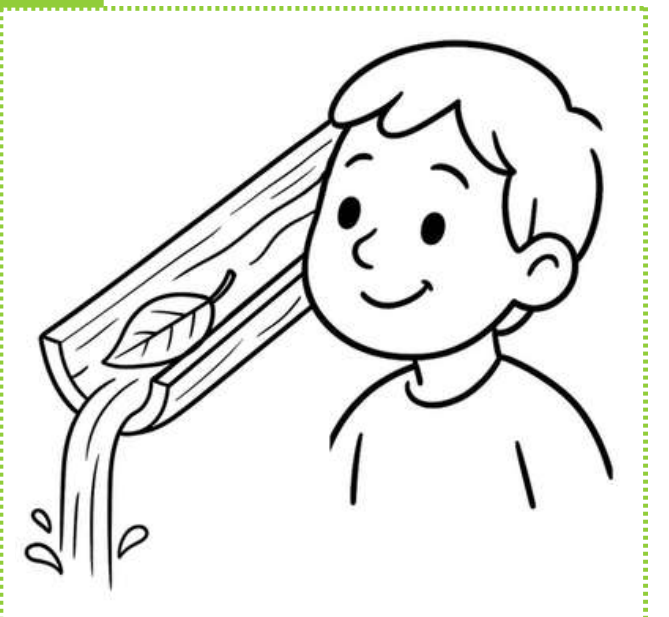
3.

YOU WILL WRITE AND DRAW YOUR OBSERVATIONS IN THE WORKSHEET.



4.

PAY ATTENTION TO HOW OBJECTS MOVE, WHAT STOPS THEM, AND WHAT AFFECTS THE SPEED OF THE WATER.



# WATER FLOW IN A CHANNEL

NAME:

CLASS:

DATE:



**DRAW YOUR OWN CHANNEL AND MARK THE DIRECTION OF THE WATER WITH AN ARROW.**

**DRAW THE MATERIALS YOU USED TO BUILD YOUR CHANNEL.**

**WHAT OBJECTS DID YOU PUT IN THE CHANNEL?**

DRAW THE OBJECTS THAT REACHED THE END OF THE CHANNEL IN **GREEN**.



DRAW THE OBJECTS THAT STOPPED IN **RED**.



**WHICH OBJECT MOVED THE FASTEST?  
WHY?**

**WHAT COULD YOU CHANGE TO MAKE  
THE WATER FLOW FASTER?**

(DRAW OR WRITE YOUR ANSWER.)





# Solar Cooker

## TEACHER PREPARATION

### 1. Prepare the materials for each group (3–4 students):

- Cardboard box with a lid (e.g., a shoebox)
- Aluminum foil, black paper, transparent plastic wrap
- Glue, tape, scissors, ruler, pencil
- Small container with a piece of chocolate
- Stopwatch or timer, thermometer (optional)
- Observation worksheet



### 2. Choose a sunny and safe outdoor location for the experiment.

### 3. Prepare one sample solar cooker to demonstrate how it works.

## STEP-BY-STEP GUIDE

### 1. **Start a discussion:** “How do we know the Sun gives off heat?”

Explain how a solar cooker works: sunlight reflection, heat absorption, and the greenhouse effect. Show the materials and describe the process.

### 2. **Building the Cooker:**

- Open the box. The lid will act as a reflector.
- Line the inside of the box with aluminum foil.
- Place black paper at the bottom (to absorb heat).
- Place the dish with chocolate in the center.
- Cover the inside of the lid with aluminium foil and position it at an angle so it reflects sunlight into the box.
- Cover the opening of the box with transparent plastic wrap (to create a greenhouse effect).
- Seal the edges tightly so the heat doesn't escape.



### 3. **Experiment and Observation** Place the cooker in direct sunlight. Start the stopwatch and observe how long it takes for the chocolate to start melting. Record the start and end time, and draw what you see. Optionally, measure the temperature inside the cooker.



## REFLECTION QUESTIONS

1. Why did the chocolate melt? What helped the most?
2. Compare the melting times between groups.
3. How is this related to solar energy, light reflection, and heat absorption?
4. What would happen if you used white paper instead of black? (less heat absorption, slower melting)
5. How could you improve your solar cooker design? (e.g., adjust the reflector angle, use more foil layers, seal plastic wrap better)

## EXTENSION ACTIVITIES

1. Material Comparison Experiment: Replace black paper with white paper and compare melting times.
2. Temperature Monitoring: Use a thermometer to record the temperature inside the cooker.

## NOTES FOR TEACHERS

### Key Concepts:

- Solar energy converted into heat energy
- Reflection of light
- Absorption of heat
- The greenhouse effect inside the cooker increases the temperature and speeds up melting.
- Energy transformation (light energy to heat energy)






# Solar Cooker

## INSTRUCTIONS FOR STUDENTS

1. Get ready: Gather all the materials.
2. Build your solar cooker step by step.
3. Place it in the sun, observe, and record your results.



### You will need:

- 
- A cardboard box with a lid (e.g., a shoebox or pizza box)
  - Aluminum foil
  - Black paper (or color the bottom of the box black)
  - Transparent plastic wrap (or clear plastic packaging)
  - Tape
  - Toothpicks, wooden sticks, or straws (to keep the lid open)
  - Scissors
  - A small container or dish for the chocolate
  - A piece of chocolate
  - A stopwatch or timer

### Experiment – Observation

- Place your solar cooker in a sunny, windless spot.
- Make sure the lid is securely tilted and facing the sun.
- Start the timer.
- Observe:
  - When does the chocolate begin to melt?
  - When does it melt completely?
- If possible, measure the temperature inside the cooker.

# Making a Solar Cooker

## INSTRUCTIONS FOR STUDENTS



**Note:** If the box and the lid are separate pieces, attach them with tape.

Cover the inside of the box with aluminium foil. It will reflect sunlight.

1.



Cover the bottom of the box with black paper. It absorbs heat.

2.



The lid will act as a reflector, so cover the inside with aluminium foil too.

3.



Place a small container (e.g., a jar lid) with a piece of chocolate in the center of the box.

4.



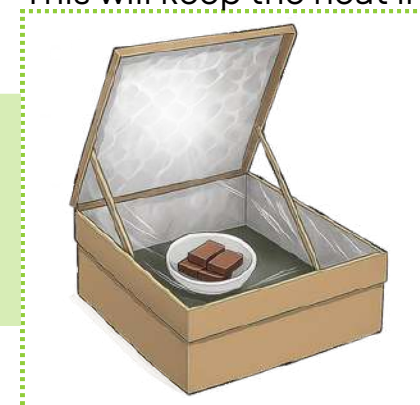
Use sticks to hold the lid at an angle facing the sun (like a mirror reflecting light inside).

5.



Cover the opening of the box with transparent plastic wrap. This will keep the heat inside.

6.



# Making a Solar Cooker

## WORKSHEET

Name:

Class:

Date:



Draw your solar cooker and label the materials you used.



Mark the lid's angle:



Acute angle (less than  $90^\circ$ )

Right angle ( $90^\circ$ )

Obtuse angle (more than  $90^\circ$ )

Experiment Log



Melting start time:

Time melting finished:

Total time:

What did you observe during the experiment?



How could you improve your solar cooker to make it more efficient?





# Windmill

## TEACHER PREPARATION

1. Prepare materials for each group (3–4 students):
  - Square paper (e.g., 15 × 15 cm, colored or recycled)
  - Scissors, glue, pins or thumbtacks
  - Straws, wooden sticks, or skewers (for the support)
  - Erasers or corks (for the axle)
  - A small sticker to mark one blade (for counting rotations)
  - A stopwatch or a clock with a second hand
  - Worksheet for recording rotations
2. Create a sample windmill to demonstrate the process. Select two testing locations: one open and one sheltered (less wind).
3. Prepare a results table (you can also draw it on the board).



## STEP-BY-STEP GUIDE

1. **Introduction:** Start a discussion: “*How do we know the wind is blowing? What does it move?*” Students can name examples: leaves, flags, wind turbines. Show the paper windmill and explain: “*Wind has mechanical energy that can make objects move.*”
2. **Building the Windmill:**
  - Fold the square sheet diagonally in both directions.
  - Cut along each diagonal toward the center, about two-thirds of the way.
  - Fold every other corner toward the center and fix it with a pin.
  - Push the pin through into an eraser or cork attached to a stick or straw.
  - Mark one blade with a sticker. This will help count rotations.
  - Write your group’s name and prepare a results table on your worksheet
3. **Experimenting:** Students test their windmill outdoors. One student counts the rotations; another measures time (1 minute). Record the number of rotations in the table. Repeat the experiment in a different location (e.g., a windier or more sheltered spot).





## REFLECTION QUESTIONS

1. Where was the wind stronger? Why?
2. Do we have wind power plants in our country? Where are they located?
3. What are some advantages and disadvantages of wind energy?

## EXTENSION ACTIVITIES

1. Speed Challenge: Which windmill makes the most rotations in one minute?
2. Material Comparison: Try paper, plastic, or cardboard.
3. Size Test: Do larger blades spin faster?

## NOTES FOR TEACHERS

Guide students to understand that wind causes movement, which is an example of mechanical energy. Explain that the stronger the wind, the faster the rotation of the windmill. The paper windmill is a simple model to show how wind energy can be harnessed in real life, just like in wind turbines that generate electricity.





# Windmill

## INSTRUCTIONS FOR STUDENTS

### Prepare:

- a square piece of paper (e.g. 15 × 15 cm)
- scissors
- a pin or drawing pin
- a wooden stick or straw
- an eraser or cork (to hold the pin)
- tape
- a stopwatch or a clock with a second hand
- a colored sticker or paper circle



### Making the Windmill:

1. Cut a square from thicker paper. Draw lines from each corner toward the center and cut along them partway (about two-thirds of the way in).
2. Fold the first corner toward the center.
3. Fold the second corner toward the center.
4. Fold the third corner toward the center.
5. Fold the fourth corner toward the center.
6. Fix all folded corners together in the middle using the drawing pin or pin.
7. Attach the windmill to your stick or straw. Add or draw a colored marker (circle) on one blade to help count rotations.

### Experiment:

1. Place your windmill in an open area.
2. Start the stopwatch and let it spin for 1 minute.
3. Count how many times it spins in one minute.
4. Repeat the test in a different location (for example, in a sheltered spot).

**Where did your windmill spin the fastest? Why? How did the number of rotations change depending on the location?**



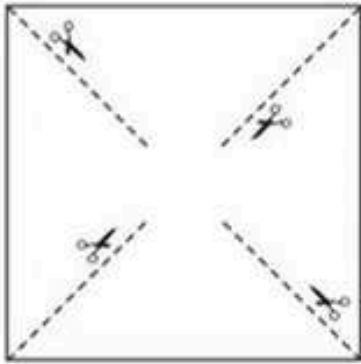


# Windmill

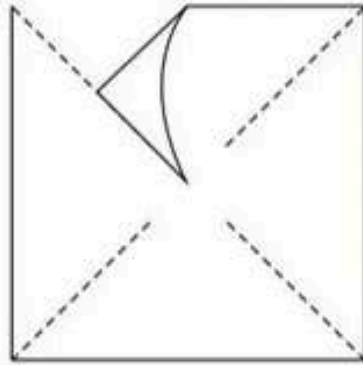
## Making the Windmill

### INSTRUCTIONS FOR STUDENTS

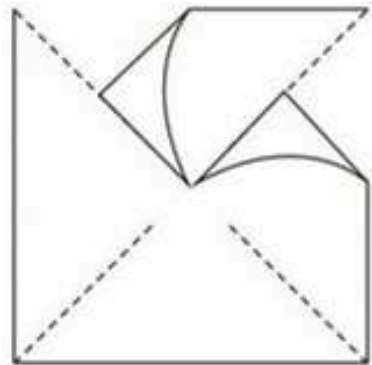
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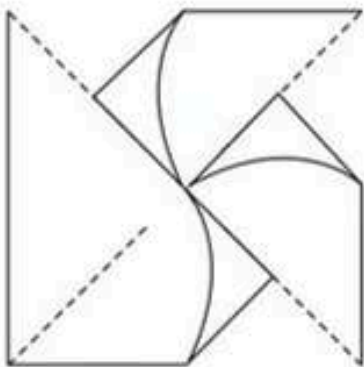
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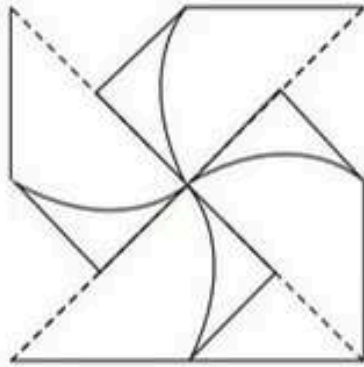
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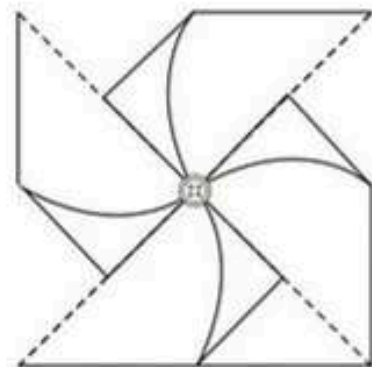
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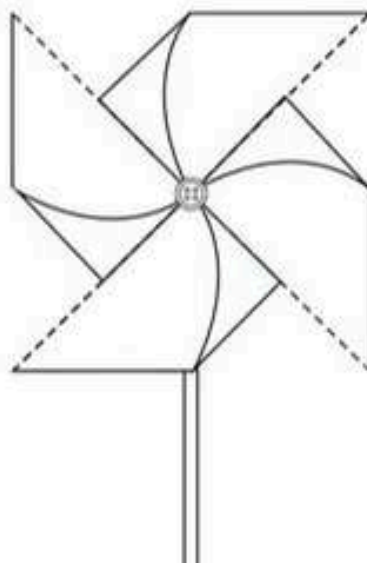
5.



6.



7.



# Windmill

## WORKSHEET



Name:

Class:

Date:

**Draw** your windmill and label the following parts:



- blades
- marker (sticker)
- pin (drawing pin)
- axle

**Record your results.**



Location (e.g., garden, school entrance, playground)	Number of rotations per minute

**What did you discover about the wind?**



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**Where did your windmill spin the fastest? Why?**



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**How could you improve your windmill to make it work better?**



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# Colorful Celery Stalk Experiment

## TEACHER PREPARATION

1. Prepare materials for each group (2–3 students):

- Fresh celery stalks with leaves (alternatives: Chinese cabbage or young Swiss chard)
- Glass jars with water (e.g., canning jars)
- Food coloring (red, blue, purple)
- Knife or scissors (for cutting stems)
- Paper towels
- Worksheet and pencils
- (Optional) camera to document changes



2. **Before the activity:** Prepare a sample jar with colored water and a celery stalk for demonstration. Choose a bright, safe location for placing jars (e.g., windowsill). On the board, draw a shared observation table (color of water, time of first visible change).

## STEP-BY-STEP GUIDE

1. **Introduction:** Start with a discussion: “How does a plant get water? Why is water important for plants?” Explain that water moves upward through the plant’s vascular system to the leaves. The water carries dissolved minerals that help the plant grow. Water is also needed for photosynthesis, where plants make sugars (stored energy).

2. Show the demonstration jar and say: “We’ll observe how water moves through a plant – and where the color appears first.”

3. **Experiment Procedure:** Fill each jar with water and add 10–15 drops of food coloring. Cut the base of the celery stalk at an angle and place it into the colored water straight away. Put the jars in a bright, draught-free place.

4. The first color changes will appear within **6–12 hours**, becoming clear after about a day.





- 5. Observing the Experiment:** Students record: color of the water, time when they notice the first change, which part of the plant (stem, veins, leaves) shows color first.
- 6. Extension Option:** Split the stalk lengthways and place each half in a different color of water. Observe the color mixing in the leaves. Students can take photos or draw predictions of how the plant will look the next day.

## REFLECTION QUESTIONS

1. Why didn't the leaves change color right away?
2. How does water move through the plant?
3. Why is this process important for the plant's survival?

### CONCLUSIONS:

Plants need water to survive. Water travels upwards through the plant's vascular tissue to the leaves. Water carries minerals and nutrients, helps cool the plant, and is essential for photosynthesis.

## EXTENSION ACTIVITIES

1. Compare different types of plants (thin vs. thick stems).
2. Repeat the experiment using two colors in a split stem.





# Colorful Celery Stalk Experiment

## INSTRUCTIONS FOR STUDENTS

### Prepare:

- a glass jar with water and a dropper or a pipette
- food coloring (red, blue, green, etc.)
- a celery stalk with leaves (you can also use Chinese cabbage)
- scissors or a knife (to cut the stem)
- a pencil and your worksheet



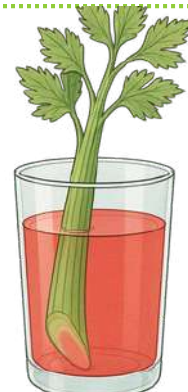
Add 10–15 drops of food coloring to the water.

1.



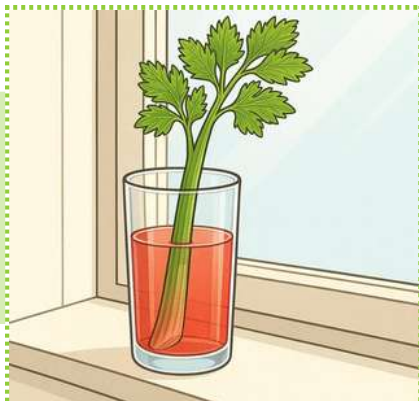
Cut the bottom of the celery stalk at an angle. Place the stalk into the jar with the colored water.

2.



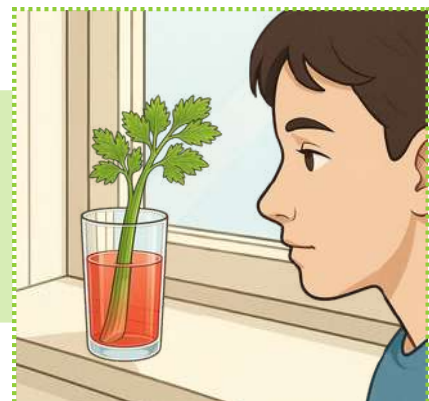
Place the jar in a bright spot.

3.



Observe how the color changes in the stem and leaves over the next few hours and the following day.

4.



# Colorful Celery Stalk Experiment

## WORKSHEET

Name:

Class:

Date:



Draw your plant before and after the experiment.



Color of the water:



I noticed the first change after  hours.

Which parts of the plant changed color?

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Which color was the most visible?

What did I discover?

- How does water move through the plant?
- Why did the leaf change color?



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# Wind Turbine

## TEACHER PREPARATION

1. Prepare materials for each group (2–3 students):
  - 1 empty plastic bottle (1.5 L) – for cutting blades
  - Cork stopper
  - Cardboard circle (6–8 cm diameter, for blade attachment)
  - Small DC motor (from old toys or CD-ROM drive)
  - LED (light-emitting diode)
  - 2 thin wires
  - Base (wooden board or thick cardboard)
  - Hot glue gun or tape
  - Scissors and a craft knife
  - Paper for sketches, markers
  - Wooden stick or skewer (for mounting)



## BEFORE THE ACTIVITY

1. Check that all motors and LEDs work.
2. Prepare a simple demo model of the turbine.
3. Choose an outdoor area with enough wind for testing.

## STEP-BY-STEP GUIDE

1. Discussion: “*What is wind? How can we use it as a source of energy?*” Give examples: windmills, wind farms. Explain that wind is a free, clean source of renewable energy.
2. How it works: Wind turns the blades → mechanical energy of rotation → the motor works as a generator → creates electric energy → the LED lights up.
3. **Building the Wind Turbine:**
  - Blades: Cut 4–8 identical blades from the plastic bottle. Gently bend the blades to better catch the wind. Attach them to a cork stopper or to the cardboard circle.



- **Shaft and Base:** Attach the cork to the center of the cardboard disk. Insert the motor shaft into the cork. Secure the motor to the base (wood or thick cardboard) so it stays stable while it spins.
- **Connecting Electricity:** Connect the metal contacts of the motor to the LED diode using insulated wire. If the LED doesn't light up, swap the wires (reverse the polarity).
- **Testing:** Take the turbine outside in the wind. Observe: Does the LED light up? How fast do the blades spin? Optionally, measure the voltage using a voltmeter.

#### 4. Students record:

- The number of rotations in 30 seconds.
- Whether the LED lights up (and how brightly).
- Which blade design (shape, size, or number) was most efficient.

#### 5. Students repeat 2–3 trials using different blade shapes or wind speeds.

## REFLECTION QUESTIONS

1. How did we use wind as an energy source?
2. When did the turbine spin the fastest?
3. How did the shape, size, or number of blades affect its performance?
4. How do real wind turbines work?



## EXTENSION ACTIVITIES

1. Compare different blade materials (plastic, cardboard, aluminum).
2. Test different blade angles (flat vs. curved).
3. Add a small capacitor to store energy and keep the LED glowing for longer.
4. Calculate rotation speed: number of rotations ÷ time (rotations per second).



# Wind Turbine

## Building a Wind Turbine

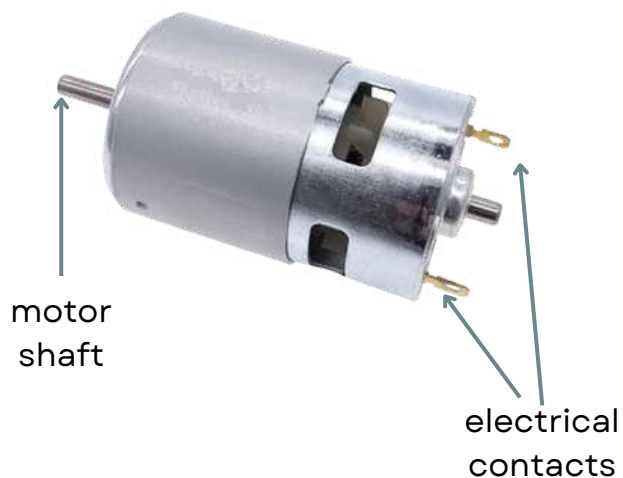
### INSTRUCTIONS FOR STUDENTS

#### Materials Needed:

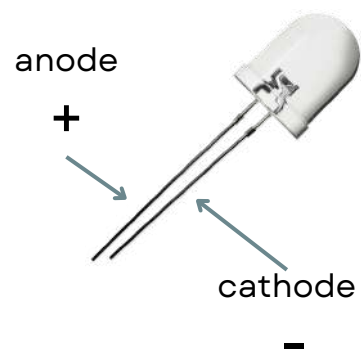
- 1 empty plastic bottle (1.5 L) – for cutting the blades
- Cork stopper
- Cardboard circle (diameter 6–8 cm, for attaching blades)
- Small DC motor (from old toys or CD-ROM drive)
- LED (light-emitting diode)
- 2 thin wires
- Base (a wooden board or thick cardboard)
- Hot glue gun or tape
- Scissors and craft knife
- Paper for sketches, markers
- Wooden stick or skewer (for mounting)



**DC Motor**



**LED Diode**





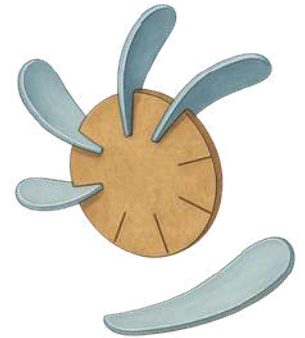
## Steps to Build Your Wind Turbine

### 1. Prepare the plastic bottle and cut the blades.

Clean the bottle and remove any labels. Cut out 4–8 identical blades (about 12 × 2.5 cm). Each blade should be slightly wider at the top and have rounded edges. Gently bend each blade along its length (like a shoehorn) so it can better catch the wind.

### 2. Prepare the cardboard disc and add the blades.

Cut a cardboard disc about 6 cm in diameter. Make 4–6 small slits (about 1 cm long) evenly spaced around the edge. Slide the blades into the slits so they all curve in the same direction and sit at a similar angle. This helps the turbine spin smoothly.



### 3. Glue the cork into the center of the disk.

Attach the cork stopper to the center of the cardboard disk using hot glue. The cork will act as a connector between the disk and the motor shaft.

### 4. Insert the motor shaft into the cork.

Carefully push the metal shaft of the motor into the cork. If needed, make a small pilot hole first. Make sure the shaft is perpendicular to the disk so the turbine spins evenly.

### 5. Secure the motor to the base.

Use a wooden board or sturdy cardboard as a base. Fix the motor firmly using rubber bands, zip ties, or hot glue so it doesn't move.

### 6. Mount the motor on a vertical stick.

Insert the wooden stick into the base and fix the motor with turbine on top. This will allow your turbine to stand upright and spin more freely in the wind.

### 7. Connect the wires to the LED.

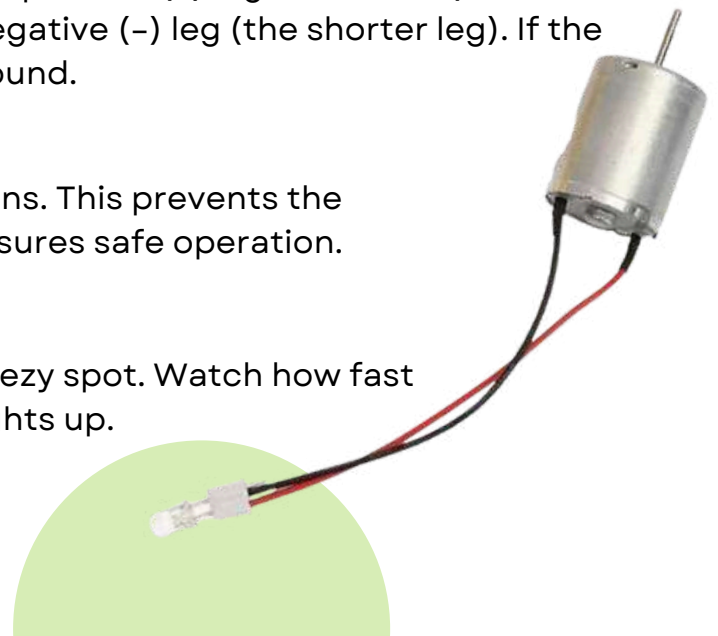
Connect one wire from the motor to the positive (+) leg of the LED (the longer leg), and the other wire to the negative (-) leg (the shorter leg). If the LED doesn't light up, swap the wires around.

### 8. Insulate the connections.

Wrap a tape around the wire connections. This prevents the wires from touching each other and ensures safe operation.

### 9. Test your turbine.

Take your wind turbine outside to a breezy spot. Watch how fast the blades spin and whether the LED lights up.





# Wind Turbine

## WORKSHEET



Name:

Class:

Date:

### Draw your wind turbine and label:

- Blades
- Shaft
- Motor
- LED diode

### How does the wind create electricity?



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### How could you improve your turbine?



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### Record your results.



Number of blades	Number of rotations in 30 seconds	LED lights up (YES/NO)	Notes



# Geothermal Energy – Earth’s Heat

## TEACHER PREPARATION

### 1. Prepare materials for each group (2–3 students):

- 2 thermometers (digital or analog; ideally one with a long sensor probe)
- A metal rod, drill pipe, or thick wooden stick (to make a hole 30–50 cm deep)
- A plastic tube or straw (for inserting the thermometer sensor)
- String marked in centimetres (to measure depth)
- Pen, worksheet, hard surface for writing
- Optional: a map of geothermal sources in your country.



### 2. Choose a safe outdoor location with soft soil for easier drilling. Prepare one demonstration measurement to show pupils how to measure temperature at different depths.

### 3. Draw a table or graph on the board for recording class results.

## STEP-BY-STEP GUIDE

### 1. Ask students: “What does geothermal mean? Where does the Earth’s heat come from?”

2. Explain: Explain that below the ground, the temperature becomes more stable and is often warmer than the air at the surface, especially when you go deeper. This underground warmth is called geothermal energy. People use it to heat buildings and water, and in some places to generate electricity. At shallow depths (30–50 cm), the temperature is mostly influenced by solar heating and changes with the weather. Deeper underground, the temperature stays much more constant because it is less influenced by surface conditions and is linked to the Earth’s internal heat.



### 3. **Conducting the Experiment – Measuring Ground Temperature:** Each group selects two measurement points: POINT A: ground surface (0 cm), POINT B: depth of 30–50 cm.



4. Use a rod or pipe to make a small hole for the thermometer probe.
5. Place one thermometer at the surface and the other into the hole. Wait 2–3 minutes for the readings to stabilize.
6. **Students record:** air temperature, surface soil temperature, deep soil temperature (30–50 cm), the difference between surface and deep readings. They can repeat measurements at different times of day or under different weather conditions, and compare stability.
7. Encourage students to draw a simple graph showing how temperature changes with depth.

## REFLECTION QUESTIONS

1. Why is the temperature underground more stable than at the surface?
2. How can we use this knowledge to take advantage of geothermal energy?
3. How could this heat be used for heating buildings or greenhouses?

## EXTENSION ACTIVITIES

1. Long-term study: Take measurements over several days and create a temperature graph (surface vs. depth).
2. Time of day: Compare morning, midday, and afternoon readings. What changes at the surface? What stays more stable deeper down?
3. Different surfaces: Compare grass, sand, and pavement. Where are the temperature differences greatest?

## NOTES FOR TEACHERS

Guide students to conclude that the temperature underground is more stable because the soil acts as a natural thermal insulator. The deeper you go, the less the temperature is affected by sunlight, wind, and daily weather changes. This steadier underground warmth can be used in sustainable ways, such as helping to heat buildings (for example with ground-source heat pumps) or supporting plant growth in greenhouses.

# Geothermal Energy – Earth’s Heat



Find out how the temperature underground differs from the temperature on the surface.

## INSTRUCTIONS FOR STUDENTS

### Prepare:

- 2 thermometers
- A stick or metal rod to make a small hole in the ground (depth: 30–50 cm)
- A piece of string with depth markings
- Worksheet and pencil



### Safety:

Be careful when handling sharp sticks or metal objects. Wash your hands after the activity.

### Steps:

1. Measure the air temperature and the temperature at the surface.
2. Gently lower the second thermometer into the hole (30–50 cm deep).
3. Record the time of measurement.
4. Wait 2–3 minutes for the temperature to stabilize.
5. Write down the results and calculate the difference between surface and underground temperatures.
6. Compare your results with classmates and discuss why the temperatures are different.



# Geothermal Energy

## WORKSHEET

Name:



Class:

Date:

Fill in the table below.

Measurement	Time	Temperature (°C)	Graph (temperature on the Y-axis, time on the X-axis)
Air temperature			
Soil surface (0 cm)			
Soil depth (30-50 cm)			
Difference (depth - surface)			

Draw the two measurement points (surface and depth) and write down the temperatures you recorded.



Why is the temperature underground different from the temperature at the surface?



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How could this heat be used in practice?



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# Designing a Sustainable and Energy-Efficient School Garden

## TEACHER PREPARATION

1. Prepare materials for each group (2–3 students):
  - Drawing paper (graph paper or A3 format)
  - A map of the school garden or a blank layout with cardinal directions marked
  - Measuring tape and a compass (to determine orientation)
  - Colored pencils, markers, ruler
  - Photos of sustainable solutions (composter, rainwater collector, solar light, greenhouse, etc.)
  - Worksheet
  - (Optional) Computer with design tools such as Canva, Tinkercad, or PowerPoint
2. Prepare a base layout of the school garden for each group and define observation points (sun, wind, shade, humidity).
3. Set up a presentation space (board or display wall).



## STEP-BY-STEP GUIDE

1. Start a discussion: “*Why should a school garden be sustainable and energy-efficient? Which renewable energy sources do we know?*” (Sun, water, wind, biomass)
2. Explain that sustainable energy use means relying on renewable energy sources (sun, wind, biomass, water) in ways that do not deplete natural resources. Show examples: compost bin (biomass), solar light, rainwater tank, greenhouse. Tell students the goal: “*Your group will design a school garden that includes at least three energy features using natural resources in a sustainable way.*”
3. **Planning the Garden’s Energy Design**

- Observation and Analysis: Each group examines the garden (or layout) and marks sunny and shaded areas, windy and calm zones, and moist and dry areas.





- **Concept Design:** Each group chooses at least three energy elements, for example: solar energy (solar lights, a mini solar panel, greenhouse), water (rainwater collector, drip irrigation), biomass (compost bin, compost-heated greenhouse), wind (mini wind turbine).
  - **Creating the Plan:** Students draw a top-view plan of the garden, marking all selected energy elements. Add a color key legend, cardinal directions, and a short explanation of how each energy source is used in that location.
4. Groups present their designs (poster, PowerPoint, or model), explaining the placement choices (e.g., “The compost bin is in a sunny area,” “The rainwater tank is next to the roof”).
  5. After all presentations, the class discusses and selects the most practical and feasible solutions for the real school garden.

## REFLECTION QUESTIONS

1. Which element could we implement this year?
2. Which parts of the plan could students create or build themselves?

## EXTENSION ACTIVITIES

1. Create a 3D model of the garden using Tinkercad or Canva.
2. Compare the students’ plans with the actual garden and suggest which elements could be implemented next school year.





# Designing a Sustainable and Energy-Efficient School Garden

VISUAL MATERIALS



solar garden light



compost bin



rainwater collector



greenhouse



solar panel system



wind turbine



# Designing a Sustainable and Energy-Efficient School Garden

## INSTRUCTIONS FOR STUDENTS

### What are we going to do?

We will explore how the school garden can become energy-efficient and sustainably designed. Your task is to create a plan for a sustainable school garden that uses natural energy sources.



### OBSERVE!

Go to the school garden and take notes:

- Where is the sun?
- Where does the wind usually blow?
- Where are the shady, wet, or noisy areas?
- Write down your observations.



### PLAN!

Draw a top view (map) of the school garden.

Plan at least three sustainable energy solutions for your garden.

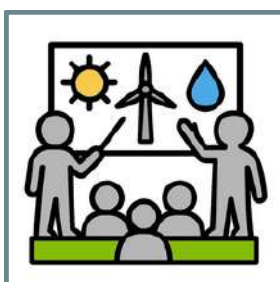
Decide where each element will be placed, its purpose, and how the elements connect to each other.



### CREATE!

Present your idea as one of the following:

- a drawing (with a legend, colors, and compass directions),
- a PowerPoint presentation (if you're in the computer lab), or
- a model (mock-up) (if you have time and materials).



### PRESENT!

Show your plan to the class and explain:

- What did you design?
- How does it work?
- Why is it sustainable?



# Designing a Sustainable and Energy-Efficient School Garden

## WORKSHEET

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Class: \_\_\_\_\_

### 1. OBSERVE!

Write down what you noticed in the school garden:



Where is there the most sunlight? .....



Where does the wind blow most often? .....



Where are areas of shade, moisture, or noise? .....

### 2. PLAN!

List three renewable energy sources that could be used in the school garden:

1. ....

2. ....

3. ....



**Draw a simple top view (map) of the school garden including at least three energy elements (e.g. solar panel, wind turbine, rainwater collector).**

- Add a legend and mark the cardinal directions.



### 3. CREATE!

How will you present your idea?



- drawing
- PowerPoint presentation
- model

Describe what you will use:

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### 4. PRESENT!

Circle: Did you present your plan to the group?  YES  NO



Write two things you learned today about sustainable energy:

1. 

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2. 

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## Further Exploration

- **Urban school garden, a teacher's guide**
- **Gardening Etiquette**
- **Gardening Journal**
- **Climate Promise:** *What is the sustainable energy transition and why is it key to tackling climate change?*
- **10 ways to be more sustainable in your garden**
- *Renewable energy use on community gardens and city farms*

