CURRICULUM

Through Upcycling to the Design of Eco Cities

CITIES FOR THE FUTURE

Erasmus+

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Credit: Street Lab, New York City, www.streetlab.org

Module 1

SHARING THE CITY

> If we wait for governments, it will be too late. If we act as individuals, it'll be too little. But if we act as communities, it might just be enough.
> And it might just be in time.
>
> (Rob Hopkins)

1. INTRODUCTION

The concept of the Sharing City means striving towards making the entire city our home - not only our homes we live in but our streets, our neighbourhoods and our public places. The city can nourish us, inspire us, offer us comfort, and provide for us, but it also needs our care and agency in return. The more we make our city our home, the more we have to care for it and maintain it just as we do with our homes. Urban infrastructure can be used by everyone, but is also dependent on everybody's responsibility. It can reflect how we want to live in cities and what we want to be our guiding principle of social interaction: solidarity instead of competition. A societal self-conception of mutual appreciation and support can be woven into the fabric of the city by supporting how people can share resources, skills and space in the city.

The Sharing-City-movement has proven, that community-based solutions can be implemented on all levels of a city's administration. From housing, waste treatment, energy and water management to food provision and mobility (Shareable, 2018, (check out Further Exploration 5)**.** Those solutions often started in a small circle: In the family, in the neighbourhood, in a classroom, in an office and proved later on that they can keep up with market-based solutions. This is because, as noble price winner Elinor Ostrom explored, commons-based resource management is often more efficient and long-lasting than state or market approaches (Vulk Coop, 2020).

Commons are the material and non-material goods that are shared within a society: "The wealth that we inherit or create together and must pass on, undiminished or enhanced, to our children. Our collective wealth includes the gifts of nature, civic infrastructure, cultural works and traditions, and knowledge. A sector of the economy (and life!) that generates value in ways that are often taken for granted – and often jeopardized by the Market-State." (Bollier, 2011, (check out Further Exploration 1).

But in fact, the commons is also the relationship between a resource and its users. It includes the value we attribute to our resources and how we want our fellow city dwellers to enjoy the same resources as we do.

In our kindergartens and schools, sharing is a principle that is taught to kids from a very young age, as it secures peace and establishes equality. What if we took that as a model for all urban interactions as a bottom-up approach to inclusion and participation? Sharing as a principle that kindergarten children can grasp seems simple, but in fact can be a revolutionary act of redistribution, to provide more people access to more resources.
Let's explore how this can be initiated at a young age, teaching them a sharing mindset and as teachers by modelling it on as many levels as possible.

Library of Things is a social enterprise in London, UK that helps people save money and reduce waste by affordably renting out useful items like drills, sound systems and sewing machines from local spaces – and by helping neighbours share practical skills.
https://www.libraryofthings.co.uk/
Credit: Library of Things Ltd. UK

1.1 SHARING THINGS AND SKILLS AT SCHOOL

The school community is an ideal example of a society where different talents, (financial) resources and interests exist. Kids can experience how it is to support, help, and learn from each other. This is at the core of sharing the city. The community is the true secret weapon for bypassing the unequal distribution of resources. Oftentimes, schools prepare students for the competition of talent and resources, reiterating the zero-sum-theorem that whenever someone gets more, it is taken from someone else. In fact, this kind of thinking might be true for some things, but this is not true for most live-enriching things (material and immaterial). Where there is a culture of sharing, more resources are available, solidarity grows, connection grows and appreciation for the common good as well (Clarke and Rockefeller, 2020).

The more people contribute, the richer the school community becomes. This affects not only material resources but also immaterial goods. Imagine what different talents are represented in a school community beyond academic skills. In what way could a school community express its diversity if everyone's talents were appreciated?

Regarding material possessions, this rethink can also facilitate a less materialistic worldview in kids, as wealth and abundance are not perceived individually but as a community. Simultaneously, marginalisation and bullying due to a lack of financial resources can be opposed, and material resources lose value as the currency of social distinction. While this might sound idealistic, there are many ways a school community can foster sharing and even stimulate learners to expand the sharing mindset to new territories.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Ethics, learning area "I in the We"

SUBJECT: Science lessons / STEM, learning area "Life in Community":
- Similarities and differences between people / between children and adults
- Passions, talents, dealing with disabilities
- Reflection on own strengths and weaknesses

SUBJECT: Ethics, learning area "We in the world":
- Experiences and ideas of justice and injustice

1.2 SHARING IN THE COMMUNITY

Why should we expand a sharing mindset beyond our friends, beyond our family and beyond our school community? What can we win as a society if we share with our neighbours next door, but also next house, next block?

Sharing in a community can be anything from sharing a garden or a washing machine in your building to sharing cars. Some neighbourhoods are dense, and actually, density is considered by city planners as a solution to the high environmental impact of cities as opposed to the suburban sprawl (Sim and Gehl, 2019), where space for biodiversity is lost, and an immense amount of resources needs to be invested (Smart Prosperity Institute, 2023). Even though it is environmentally smart to live with less space (e.g. to heat or cool), fewer resources and possessions, this kind of behavioural change is hard to force. Sharing is the key to turning doing without into abundance. How many things do we own that take space and are not used regularly? They might have been produced under exploitative conditions, most probably been shipped across the ocean and will take a lot of effort to be discarded properly. This negative environmental impact can be improved fundamentally if it is at least made to good use (Clarke, 2023). Cities are predestined to widely apply sharing, as it reduces land-use footprint, saves budgets in low-income neighbourhoods, and gives them access to resources they might not otherwise have access to (like using electric cars or cargo bikes).

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Ethics, learning area "We in the world":
- Difference between natural world, man-made world and world of thought
- Shaping and preserving our world
- Experiences and ideas of justice and injustice

SUBJECT: Science lessons / STEM, learning area "Life in Community"
- Opportunities of participation and co-determination (class, school, family, neighbourhood, community ...)

SUBJECT: Science lessons / STEM, learning area "Work and consumption" /"A product of our country":
- Production processes
- Selection criteria for purchase (benefits of the product, longevity, global transport routes, waste avoidance, ecological aspect, fair trade)
- Desires, needs and their fulfilment - building reflective and self-regulated consumer behaviour

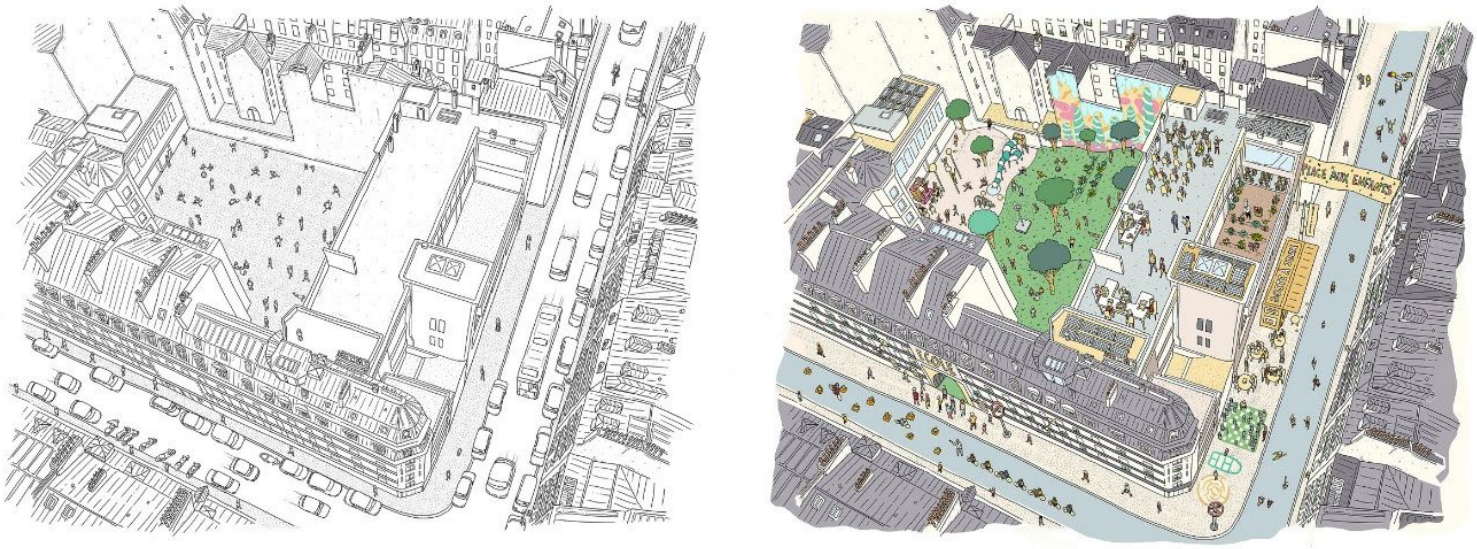
Sharing cargo bikes in Leipzig, Germany. The TINK network supports cities in establishing an infrastructure for cargo bike sharing. Source: City of Leipzig, Roland Quester

Transformed street in the superblock of the Poblenou-neighbourhood in Barcelona. Title: Superilla Poblenou, Credit: Ajuntament de Barcelona

1.3 SHARING SPACE AND TRANSPORT

Public space in the city has been imprinted by the car. Streets that catered mainly to motorized transport are often hostile for pedestrians, especially from a child's perspective (and height). Driveways fragment sidewalks, parked cars obstruct the view, and pedestrian crossings can be hard to oversee. Overall, those conditions make independent movement in the urban space a challenge for children and also for people with seeing, hearing or walking impairments. Creating an inclusive city, therefore, unavoidably means shifting incentives from private motorized transportation to collectively more efficient and inclusive forms of transport. These must be diverse to address the demands of as many people as possible. Giving up cars in the urban streetscape can create space for an infrastructure that supports public transport, biking and walking. All of which have less or no negative impact on the environment. On the contrary, the opportunity for physical movement has numerous positive effects on our physical and mental health. Walkable neighbourhoods generate also connections and make us feel more at home in public as they allow more encounters with our neighbours (Montgomery, 2015).

With less emphasis on the car, streets can evolve into multifunctional, inclusive spaces that make cities environmentally but also socially sustainable. Urban planners and city legislators worldwide are discovering the multi-faceted potential of redistributing urban space. The guiding star for this development is the City of Barcelona's SUPERILLES – SUPERBLOCKS. With the slogan "Let's fill the streets with life", in 2015, the municipality started transforming street networks into car-free zones allowing cyclists, public transport and pedestrians to reclaim the street (Roberts, 2019). Parisien mayor Anne Hidalgo implements a similar concept with the 15-minute-city (Luscher, 2021). This concept aims to bring back to residents' arm's length the services that were outsourced to shopping centers and designated commercial zones. They create mixed-use cities that provide residential areas and commercial, health, cultural and leisure services (Moreno, link to Further Exploration 4). By reorganizing and topping up local services, assigning multiple purposes to the common space and adapting the rhythm of the neighbourhoods to humans, not cars, Hidalgo is making the most of Paris' already existing density. Nicolas Bascop's illustration for Paris en commun gives a vivid impression of a schoolyard and adjacent street corners before and after the transformations in progress (Paris en Commun, 2020).



Transformation of a school yard into an accessible multi-functional space for the community.
Title: Paris en commun, Ecole avant après
Credit: Nicolas Bascop, www.nicolasbascop.com

The infrastructure change delivers new incentives to cyclists and pedestrians to reduce transport-related carbon emissions and air and noise pollution. For children and families who live on those streets, this transformation provides a safe, walkable and playable surrounding (ARUP, 2017, see also Further Exploration 3). At the same time, it creates an infrastructure that allows people of all ages and abilities to move and provide for themselves independently. The additional benefit of such a transformation is creating opportunities for connection and by such, significantly improving the actual quality of life (Montgomery, 2013).

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Ethics, learning area "Togetherness"

SUBJECT: Science lessons / STEM, learning area "Life in Community"
- Different forms of social life (family forms, class and school community, "home" ...)
- Relationships between the generations

SUBJECT: Art, Learning Area "Physical-Spatial Design"
- Experimenting with found materials or objects
- Exploring indoor and outdoor spaces and their function and experiencing their atmosphere
- Designing interior and exterior spaces
- Designing objects of daily use
- Form and function of the built environment: architecture

SUBJECT: Science lessons / STEM, learning area "Encountering space and time"
- Getting to know the local/regional environment (school and school grounds, public facilities in the school and residential environment, traffic routes)
- Assessment/evaluation of local conditions
- Assessment/evaluation of own and other mobility concepts (transport-oriented, social, ecological)

SUBJECT: Science lessons / STEM, learning area "Living and learning together" / "Past, present and future":
- Changes in the city (importance of inner-city space, density in road traffic) - Future workshop, own possibilities for action

VISIONARY BOX

Leipzig in Germany

Verschenkekiste (=gift box) is a free shop in a low-income neighbourhood of Leipzig's east. We spoke with Anja Scherber, one of the initiators.

What is Verschenkekiste?

Anja: Verschenkekiste is a free shop which means you can come here and take anything you want or need. And the people are allowed to bring things, that's how the shop works: books, household items, clothes, children's toys, DVDs etc.

Buying new things, e.g., t-shirts for a few euros, can be quite cheap. Why should people come to you if they need something new?

Anja: We only have used things here in the shop, and that's also the core idea of the whole thing, that people don't consume new things in the sense of newly produced things, but rather start thinking about what they might be able to use second-hand. That way, things stay in the cycle longer, and resources are saved. And it's all free of charge to keep it low threshold.

Do you have a favourite transaction that happened in the shop?

Anja: I remember one particularly curious situation. Someone in the building moved out, bringing us knee bandages that he no longer needed. And I still had the knee bandages in my hand and didn't know where to put them in the shop. And while I was still wondering, a person came in and asked: Are these knee bandages? I have insane knee problems, and they're totally expensive. It was such a WIN-WIN-WIN-situation: The person who gave them away saw how they moved on, the person who got the bandages was really happy, and I didn't have to sort them and had experienced a beautiful sharing moment.

Can you think of any building block here in Leipzig that is still missing to make the city more sustainable?

Anja: I think there needs to be a free shop like this in every neighbourhood so that people don't have to travel far and so that it feels easy. I also think that this whole neighbourhood circular economy scene needs more support from the city, for example, by providing space or money for staff. And by that, I don't just mean free shops, but also libraries of things, material collections and repair cafés. And concretely, it would be nice if there was a food-sharing café here where rescued food could be processed. That's what this city is still missing!

https://verschenkekiste.de/

Verschenkekiste e.V., Credit: Lilja Friedemann

FURTHER EXPLORATION

David Bollier wrote the manifest on the commons and its potential to rebuild our society in a bottom-up and grassroots approach.
Bollier, D. (2017). Think Like a Commoner: A short introduction to the Life of the Commons. New Society Publishers.

Sheila Foster is a researcher and professor of environmental law and urban commons at Georgetown University. In this video, she is in exchange with two practitioners of the sharing movement. YouTube. (2017, October 31). Cities and Commons: Sheila Foster interview W Jerry Michalski and Neal Gorenflo.
YouTube. https://www.youtube.com/watch?v=BkUaUuujuYU

Read Arup's guide to the child-friendly approach: Cities Alive for more information on child-friendly cities. Designing for Urban Childhood. It is available online and provides 40 global practices of child-friendly urban interventions.
Arup (2017). Cities Alive. Designing for urban childhoods. https://www.arup.com/perspectives/publications/research/section/cities-alive-designing-for-urban-childhoods

Carlo Moreno is the pioneer of the 15-minute City movement, and in this TED Talks, he explains the four building blocks of the concept: Ecology, Proximity, Solidarity and Participation.
Moreno, C. (n.d.). The 15-Minute City. Carlos Moreno: The 15-minute city | TED Talk.
https://www.ted.com/talks/carlos_moreno_the_15_minute_city/details#t-457530

Shareable is THE online hub of all things sharing. Currently, they offer webinars, tools and templates for setting up a library of things in your community.
Library of Things Co-Lab. Shareable. (2023, June 14).
https://www.shareable.net/library-of-things-co-lab/

CONNECTED ACTIVITIES

Sharing Things and Skills at School
The Swap Shop
Flea Market
Talent Marketplace
Party Kit

Sharing in the Community
The History of Things

Sharing Space and Transport
Streets are for People
The Ultimate Bus (Stop)
The Walking School Bus

Module 2

CIRCULAR CITY

> Nature is the ultimate zero-waste environment. In fact, in nature, there is no such thing as waste. Everything is in a cycle. By contrast, many of our human-designed systems and products have been made in a linear model – and the end of the line is the dump.
>
> (Rob Greenfield)

2. INTRODUCTION

Cities are producing an estimated 2 billion tons of municipal solid waste, which is projected to increase to 3.4 billion by the year 2050 due to urbanization and economic growth (UN Habitat, 2021). The improvement of waste management is considered an essential lever in making cities more sustainable and, as such, mentioned as a subgoal of SDG11: "By 2030, reduce the adverse per capita environmental impact of cities, (...) by paying special attention to (...) municipal and other waste management" (United Nations).

What if cities were to engage in a paradigm shift inspired by nature, where nothing is 'wasted'. A lot can be done to minimize the share of things that fall out of the cycle as actual waste. The legislative side can enforce measures that substantially reduce waste, like incentive regional production, higher packaging standards or better waste management.
But there are also a lot of bottom-up approaches that can help individuals drastically reduce household waste. The 4R framework is a helpful guide to reconsidering one's own behaviour and contributing to a circular city.

What are the 4 Rs?

➔ Reduce

➔ Reuse

➔ Repair

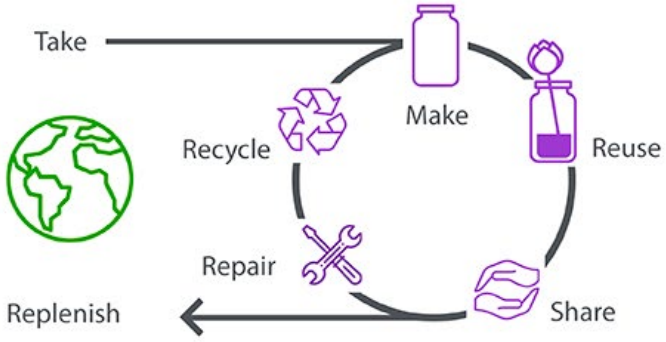
➔ Recycle

In the light of a sustainable city, not only environmentally but also socially sustainable, it is important to point out that applying the 4 Rs will eventually successfully reduce waste. It also preserves our natural resources, and it will, too, as we will point out in the following chapters, produce a lot of additional value between neighbours, generations or people with different financial resources and therefore create a supportive network within the city.
In recent years, cities worldwide have been eager to adopt circular economy principles and practices as opposed to conventional linear economies that have contributed majorly to the exploitation of natural resources and the climate crises. What is a circular economy? As UNIDO, the United Nations Industrial Development Organization, puts it: "The circular economy is a new way of creating value, and ultimately prosperity. It works by extending product lifespan through improved design and servicing, and relocating waste from the end of the supply chain to the beginning – in effect, using resources more efficiently by using them over and over, not only once" (UNIDO).

LINEAR ECONOMY

Traditional model of production and consumption where resources are made into products and used until discarded as waste.

CIRCULAR ECONOMY



New model of production and consumption that keeps materials at their highest utility and value throughout their lifecycle, and recirculated into production cycle to avoid waste.

In this understanding of urbanism, circularity is the engine of all transactions and interactions "as a comprehensive modus operandi" (CITIES Foundation, 2018) for the sustainable city.
As a bottom-up approach, the circular city is an optimal concept to engage students as they can participate in all R's with their own behaviour and actions, but also serve as multipliers in their personal environment.


Credit: Freepik.com

2.1 REDUCE – LESS IS MORE

In the light of the climate crises, we have come to realize that the consumeristic lifestyle, with all its promises of satisfaction, status and comfort, comes at a high price for our society. While having detrimental effects caused by inhuman production conditions, unfair distribution of work and a huge negative environmental impact, it can't even keep its promise of bringing well-being and happiness to the consumer. Part of consumerism is to invoke new desires with every purchase to keep consumption going. To young people, this can cause social anxiety, and there is a risk of solely defining one's identity through what you own, building self-worth on the accumulation of goods.
By encouraging students to apply critical thinking towards the omnipresent consumerism, young people become aware of their everyday decisions that can have a significant impact when met more consciously.

Particularly through fast fashion, the topic of over-consumption is central to young people and can, therefore be easily brought on school agendas (Chang, 2017, link to Further Exploration 1). At the same time, a transformation in consumer behaviour can have a direct impact when widely spread, as the fashion industry is the second largest industrial polluter, responsible for 10% of global carbon emissions and nearly 20% of wastewater (Ro, 2022).

Another great starting point to raise awareness in children on the power of reducing is food packaging, which is literally an everyday issue. Low-waste-living means rethinking what we buy and how we store and transport it. And this can start with students' packed school lunches.
This approach of micro-sustainability, where small decisions for the better are valued and multiplied in the community, is the cornerstone of creating a sustainability mindset within students.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM, learning area "My body and my health"
- Healthy food
- Our healthy breakfast

SUBJECT: Science lessons / STEM, learning area "Work and consumption" /"A product of our country":
- Production processes
- Selection criteria for purchase (benefits of the product, longevity, global transport routes, waste avoidance, ecological aspect, fair trade)
- Desires, needs and their fulfilment - building reflective and self-regulated consumer behaviour

2.2 REUSE – SAVE IT FROM THE DUMP

As the accumulation of individual possessions has long been an indicator of wealth and prosperity, buying habits were practised and are difficult to change. What do we do with the stuff we already own but don't use? The worst that can happen with something that was produced with valuable resources, bought from someone's budget, and finally stored at someone's home is to end up in the trash bin. How can we give a second (third, or fourth…) life to the things that are in the world, especially if they are hard or even impossible to recycle?

For many household items, a sharing infrastructure (link to module 1) is a solution to bring unused goods back into the game. The Buy-Nothing Movement (The Story of Stuff, 2022, link to Further Exploration 3) explores this potential by establishing a gift economy that is trying to radically reduce consumption by bringing unused clothes, electronic devices, books, toys and even food to the people who still have use for it, often supported by neighbourhood apps or social media apps.

As reuse is the skill to turn trash into new resources, this principle can be applied to almost everything. A lot of things are considered single-use only and seem destined for the dump, like packaging or technical or building materials. Increasing their lifespan saves resources, and in the school context, this can range from reusing tetra packages for upcycling projects to building playgrounds from reclaimed material (Playground Ideas, link to Further Exploration 2). It is important to consider, though, that upcycling projects should not incentivise buying products that would not have been bought otherwise for the purpose of upcycling. When choosing upcycling activities, get inspired by the resources available to you and ensure that acquisition and processing don't require extra energy and resources. At the same time, the created product should itself be suitable for further reuse or at least recycling.

Playground at Ruben Centre Playground in Uganda from reclaimed material. Credit: PlaygroundIdeas.org

When done right, the concept of reuse has the potential to circulate much further and reach much bigger scales. Regarding the sustainable city, architects explore how to use reclaimed building materials for new structures, making a statement on the currently still resource-intensive building practices and environmentally harmful demolition procedures (Overstreet, 2020).

These practices show that the concept of reuse brings about additional benefits that cannot be underestimated. On the one hand, the reuse of material makes resources accessible to all. For upcycling projects, this means that everyone can produce beautiful and functional things with no (or hardly any) financial input. Making their room, home, street, school or neighbourhood more attractive and, therefore, liveable is no question of budget.

The other benefit lies in the potential of limitations for the creation of art. Creativity often flourishes where resources are limited. Where artists face limits, unconventional solutions are found, applying creative thought and innovative techniques.
The circular city can enhance a reuse attitude among their citizens by establishing networks to bring materials that would be thrown away to where the demand for reuse is. Here the circular city is crossing paths with the concept of the sharing city, and a joint infrastructure can yield synergies.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Art, Learning Area "Physical-Spatial Design"
- Experimenting with found materials or objects
- Exploring indoor and outdoor spaces and their function and experiencing their atmosphere
- Designing interior and exterior spaces
- Designing objects of daily use
- Form and function of the built environment: architecture

SUBJECT: Science lessons / STEM, learning area "My body and my health"
- Healthy food
- Our healthy breakfast

SUBJECT: Science lessons / STEM, learning area "Plants and animals"
- Origin and cultivation of crop plants
- use and preparation for delicious meals

Playground at Ruben Centre Playground in Uganda from reclaimed material. Credit: PlaygroundIdeas.org

Intergenerational learning in a repair café in a daycare centre in VG Nieder-Olm, Germany. Source: https://repaircafe-vg-nieder-olm.de/

2.3 REPAIR – HOLD ON TO YOUR TREASURES

Keeping goods in the cycle of use and reuse as long as possible is the objective of the 4Rs; as such, repair is an important step towards achieving this. Repair has been an indispensable cultural technology in past pre-globalised societies as production was costly, effortful and resource-intensive. As a cornerstone for strengthening a circular economy today, the consumer's attitude towards repair is key and was therefore analysed by the European Commission in the report Behavioural Study on Consumers' Engagement in the Circular Economy (LE Europe et al., 2018). The study unveiled that consumers tend to have a high opinion of reparability while not behaving accordingly. In order to close "the gap between willingness to engage and actual engagement", the study gathers suggestions for future policy actions, among them making repair easier, e.g. through regulation for replaceability of components or by better labelling of reparability and durability.

As with other circular economy aspects, grassroots initiatives are the forerunners of these endeavours, showing that independence from corporations being reluctant to a circular economy can be achieved through community-driven solutions. The Repair Café movement is a network of free meeting places where people will find tools and materials to help them make any necessary repairs (Repair Café, 2023).

These initiatives bring great opportunities for intergenerational and intercultural learning, as repair skills differ according to where, when and how you grew up (link to Sharing Skills, module 1). Especially for the elderly, these kinds of institutions provide a source of self-esteem and appreciation. The value is equally high for young people learning from others, as repair skills foster a general understanding of the world around them and can strengthen their sense of self-efficacy.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Handicrafts, learning areas "Discovering technology in everyday life", "Handling materials and tools", "Maintaining and caring for technical objects"

Kokoza o.p.s., the project of community composting in Prague. Credit: https://kokoza.cz/

2.4 RECYCLING: DOING IT RIGHT!

Even though the proportion of waste that is recycled is increasing in the EU countries as well as in Serbia and North Macedonia, the rate of progress is slowing down with major setbacks due to the COVID-19 pandemic (Ebner and Iacovidou, 2021).

In the EU, the overall recycling rate has stagnated since 2014 at around 48%, leaving more than half of the waste not recycled and therefore ending up in landfills or in the dump. Recycling is defined as "any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes" (EU Science Hub). Most recycling procedures, though, are very energy-intense and should only be the last option if reuse or repair are not feasible.

If something is fed into the recycling system, it is important to do it right. There are some simple rules that apply, wherever you are living:

- Do the separating right according to the rules in your country
- Food or liquids don't belong in the recycle bin
- Avoid composite materials or take them apart before recycling
- Bring hazardous waste (medication, electronics, batteries, contaminants) to dedicated collection points
- When recycling paper, separate staples or plastic tape from it
- Remove caps from bottles and jars
- Rinse aluminium and steel cans to make them easier to process

Doing the recycling right is absolutely crucial for keeping the system effective, and this is actually something that can be trained from a very young age, as it is a hands-on, tactile, everyday activity.

Next to separating trash the right way and collecting hazardous waste (safely) like electronics or batteries, dealing with organic waste is a practice that can be experienced by students vividly, as they can witness the complete cycle from waste to valuable resource in the form of compost within just one year.

The thought of circularity is actually something that can be grasped from a very young age, e.g. by the example of processes in nature. Schools can support this by providing the right infrastructure for doing so and fostering a sustainability mindset through their teaching, actions and values.

Similarly, as with sharing (link to sharing in the community), community-driven solutions can unfold the potential of composting beyond the action radius of single households. For example, Czech NGO Kokoza (https://kokoza.cz/) is setting up composting bins in various neighbourhoods in Prague to have the citizens participate in and actually benefit from composting. With educational events, displays, community gardening and online tools, the neighbourhood connects over their contribution to the community compost.

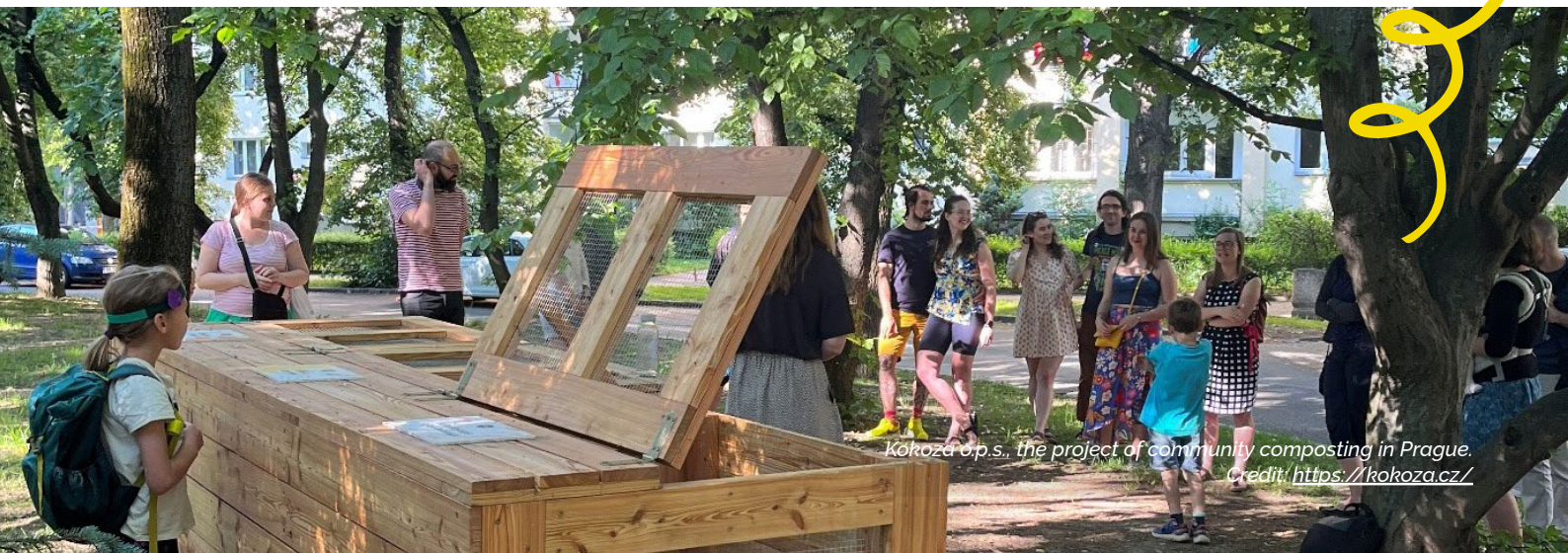
As with all practices of the circular city, recycling can generate community and a shared green attitude that can motivate individuals to show engagement in making their city more sustainable.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM, Learning Area "Environmental problem: waste"
- Waste reduction (waste avoidance, waste separation)
- Waste recovery (reuse, recycling)

SUBJECT: Science lessons / STEM, Learning area "Encounters with plants and animals"
- Importance of the soil (microorganisms, humus formation, compost)

SUBJECT: Art, Learning Area "Physical-Spatial Design"
- Experimenting with found materials or objects
- Designing objects of daily use



Kokoza o.p.s., the project of community composting in Prague. Credit: https://kokoza.cz/

VISIONARY BOX

Leipzig in Germany

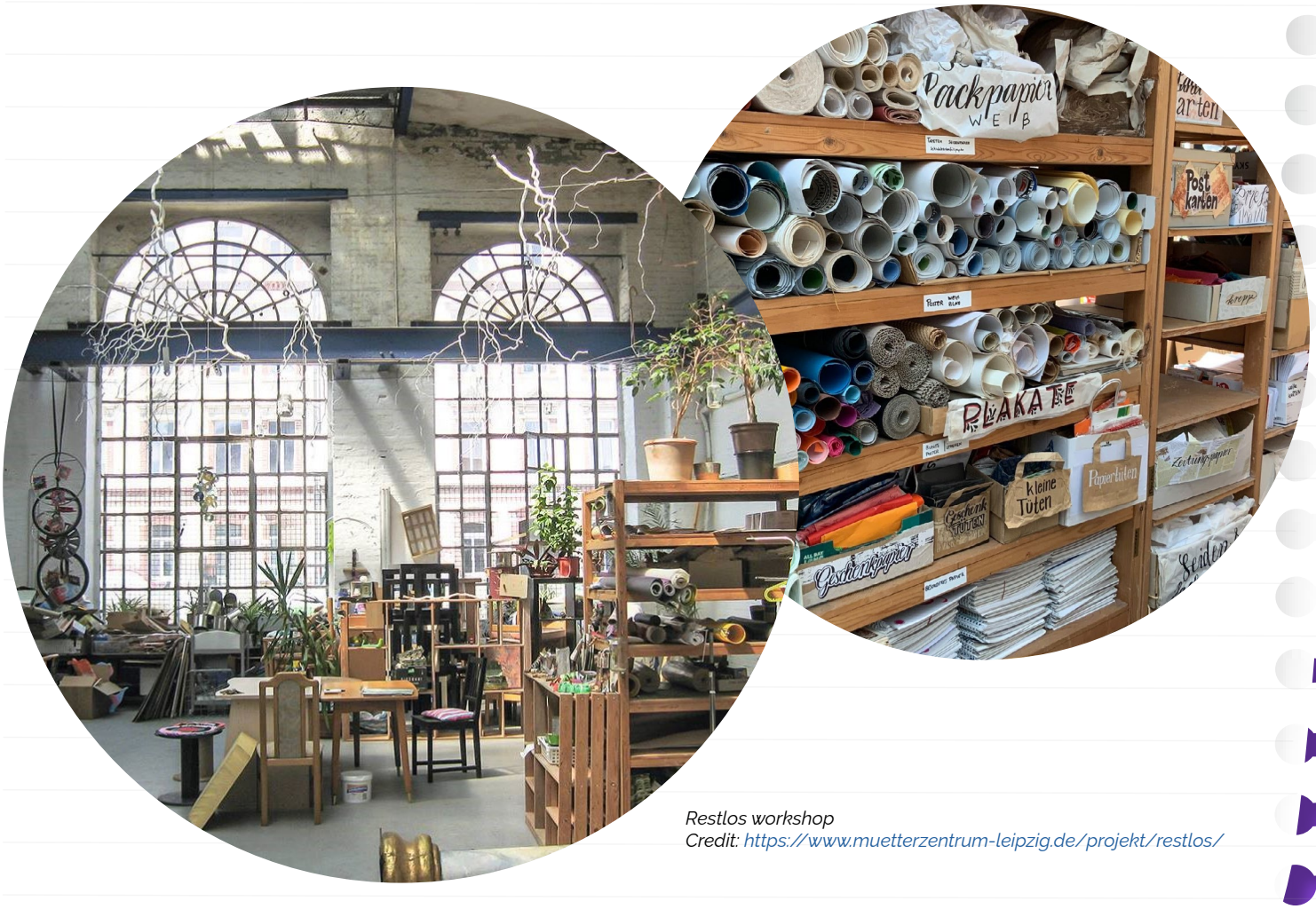
Restlos – Workshop Space for Environmental Education and Upcycling

Restlos (=leaving no rest/residue) is a material treasure trove, workshop space and environmental education project for all ages. The Restlos workshop space is a collection point for materials of all kinds, provides access to tools and equipment for craft projects and repair work and is a venue for educational events on resource-effective lifestyles.

In our times, when everything is consumed and disposed of quickly and in large quantities, we need to refocus on the value of our resources and materials and how we deal with them. How can existing materials be used sustainably? How can they be creatively and beneficially repurposed and recycled?

Dealing with these materials, reusing them and thus reducing waste strengthens environmental awareness and critical thinking playfully - and quite incidentally, unique toys, individual gifts or unusual home accessories are created.

https://www.muetterzentrum-leipzig.de/projekt/restlos/



Restlos workshop
Credit: https://www.muetterzentrum-leipzig.de/projekt/restlos/

FURTHER EXPLORATION

This 6-minute TED-Ed video demonstrates the life cycle of a T-shirt for a young audience. It shows all the externalities that the consumption and production of fast fashion entail in the example of a simple t-shirt. Chang, A. (2017, September 5). The life cycle of a T-shirt. YouTube. https://www.youtube.com/watch?v=BiSYoeqb_VY

Playground Ideas is a global non-profit organisation advocating for the value of play for quality education and childhood development. They bring playground ideas to low-budget communities. With free registration on their website, users are provided with manuals on how to build with reclaimed materials, but also plenty of other resources that support play.
Playground Ideas. (2023). http://www.playgroundideas.org/

The Story of Stuff is an organisation and online community exploring the crises caused by a linear materials economy in a reality of finite resources. The organisation creates animated and documentary videos exploring how consumerism and the climate crises are interconnected, some of them suitable for younger audiences. For an introduction, watch: The Story of Stuff. (2009b, April 22). The story of stuff. YouTube. https://www.youtube.com/watch?v=9GorqroigqM For a portrait of the Buy-Nothing Movement, watch: The Story of Stuff. (2022, December 21). Imagining an economy where you don't have to buy anything. YouTube. https://www.youtube.com/watch?v=kOskoCh8KXU

The Wasted City is a best practices collection and toolkit for circular city practices. It explores how circularity can be a new standard in city-making with case studies from all over the world. Miazzo, F., Comeau, M., & Hajer, M. (2017). The Wasted City Approach to Circular City Making. Cities Foundation.

Zero Waste Kids by environmental activist and adventurer Robert Greenfield is a handbook with activities for children to understand their waste footprint and practical tips on making a positive impact. Greenfield, R. (2022). Zero waste kids. Quarry Books.

German Resource:
Deselaers, Kristina (n.d.). RepairKids. Reparatur im Bildungskonzept. Praxisleitfaden für ein Modellprojekt.
https://www.reparatur-initiativen.de/files/kcfinder/posts/4403/files/RepairKidsManual.pdf

CONNECTED ACTIVITIES

Reduce: Less is More

Wax food wraps
Granola bars
My zero-waste school lunch

Reuse: Save it from the Dump

Making Recycling Paper
Wrapping for presents (Furoshiki) from cloth
Upcyling old t-shirts in bags, carpets etc.
Turn pants into short pants
Making feather decoration from old Jeans
Decoration from Fruit Peel
Cooking and baking with ripe fruit
Give-away food market
Rubber boot garden
Car tires for playground design
Local map of give-away-material in your neighbourhood
Mosaic from shards
Fence Weaving with old fabric or plastic

Repair: Hold on to your Treasures

Creating Patches for pants
Mending for knitted sweaters
Repair Café with parents and grandparents

Recycling: Doing it Right!

Picking up litter in the community
Create fun litter bins for the school
Carry your litter
Silly package award
Exhibition on cost/benefit of one-way-packaging
Creating a collection spot for hazardous waste at school

Credit: Street Lab, https://www.streetlab.org/

Module 3

CITY FOR ALL

> As an artificial world, the city should be so in the best sense: made by art, shaped for human purposes.
>
> (Kevin Lynch)

3. INTRODUCTION

A person living in a city is naturally part of a larger collective. Sharing interests and values is indispensable for a community that thrives through active citizenship. The purpose of this module and the corresponding activities in the handbook is to inspire how to create a city, community and school that reflects all perspectives, understanding the public as a space that enables connection and interaction.

Communities that aim to increase their inclusiveness, well-being and resilience must commit to ensuring that all residents' benefits and opportunities are available regardless of their background, abilities, or socioeconomic status. The city for all seeks to break down barriers and promote social cohesion. Furthermore, it should celebrate and preserve its cultural diversity, fostering an environment where different cultures can coexist and contribute to the city's vibrant tapestry.

Seen through the lens of children, this is a city where everyone has a fair chance to enjoy all that urban life has to offer without barriers and discrimination. It's a city where its residents, ideally, actively contribute to making their urban environment better, deciding how it should look, how it should operate, and ensuring that it reflects its inhabitants' diverse perspectives and identities.

Consider the idea of participation and engagement as a skill or ability, much like a muscle that requires exercise and training to grow stronger. By integrating the principles of participatory thinking into the educational curriculum, schools provide a structured platform where students can learn about their rights and responsibilities as citizens and how to voice their thoughts and opinions effectively. This approach instils knowledge and confidence in students, empowering them to contribute to their communities actively.

Credit: Freepik.com

Transformed street in the superblock of the Poblenou-neighbourhood in Barcelona. Credit: Ajuntament de Barcelona

3.1 MEET YOUR NEIGHBOURS

"The city is more than just a conglomeration of individuals and social services, such as roads, buildings, streetlamps, tram lines, telephones and so on; it is also more than just a constellation of institutions and administrative instruments, such as courts, hospitals, schools, police stations and civil servants of various kinds. Rather, the city is a state of mind, a body of customs and traditions, of attitudes and feelings organized within these customs and transmitted through this tradition. In other words, the city is not simply a physical mechanism and an artificial construction: it is involved in the life processes of the people who make it up; it is a product of nature, and particularly of human nature."

(Park et al., 1968, 5).

The Industrial Revolution in the 18th and 19th century brought about significant changes in the structure of cities. Rapid urbanisation resulted in large numbers of people moving from rural areas to cities in search of employment in factories and industries. This influx of people often led to overcrowded and poorly planned urban areas, making establishing strong social bonds and a sense of community difficult.

The design of cities can either foster or hinder community-building. Historically and still today, some urban planning decisions prioritise efficiency and infrastructure over community-building aspects like public spaces, walkability, and mixed land uses. These decisions contributed to a lack of community cohesion.

In an intact neighbourhood community, residents often interact with each other, share common concerns about their local environment, and collaborate on various activities or projects that benefit the neighbourhood. These communities are often characterised by a sense of familiarity and shared identity among neighbours.

However, there are several factors that make it challenging to build a sense of community in a neighbourhood:

- Many people are always on the go, and their busy lives leave little time to connect with neighbours.
- Noise, pollution and fast-moving traffic in the city can make it hard for people, especially children, to feel safe and comfortable outside their homes.
- Some people might feel like they have nothing in common with the people who live nearby. They might assume that their neighbours are very different from them in terms of interests, values, or backgrounds.

In fact, all those factors are interconnected and research like Donald Appeleyard's book "Livable Streets" showed that improving one of those conditions can have a positive impact on the others (StreetfilmsVlog, 2010). Where walkability is increased, people's chances of connecting in their neighbourhood are higher. Where there is more direct connection, there is more trust between neighbours, which brings people to the streets and makes the neighbourhood feel safer.
For children, those measures expand the space they consider home and give them the confidence to explore their direct environment independently. They can experience the city as a healthy, safe and caring place and inspire active citizenship.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Ethics, Learning Area "Togetherness"
- Coexistence of the generations
- Traditions of togetherness

SUBJECT: Science lessons / STEM, Learning Area "Living and learning together"
- Getting to know the learning and the local environment
- Public facilities in the school and residential environment
- Traffic routes in the school and residential environment
- Encountering cultural diversity

SUBJECT: Languages
- Working with written texts: comprehension and reproduction of meaning (use of texts about these topics)

3.2 MOVE THROUGH THE CITY

Everyone can contribute to building a network of accessibility. It is important to understand the value of starting a process that, from the single intervention of overcoming spatial barriers, succeeds in improving the overall quality of cities and territories. We get to this, for example, by seeing the city through other people's eyes (a child, a blind person, a person using a wheelchair, an elderly, etc....) and imagining a truly accessible city where everyone benefits from accessibility.

Let's think about how little autonomy children have in going to school and playing. Today, very few children move independently on the home-school route, and certainly not in the big cities. Francesco Tonucci's books and the experiences of "The city of children" (Tonucci, 1999) and the "We go to school on our own" (Tonucci, 2019) have been ringing the alarm for many years, reminding us how damaging the loss of autonomy in movement and free play is in this age of development and inviting city administrations, families and schools to deal with it.

The decrease in children's autonomy of movement is closely correlated with the increase in traffic. This negatively influences the conditions of the urban environment and reduces the possibility for children to carry out regular physical exercise, also influencing the parents' habits. What effect does this have on the indispensable knowledge of the environment? Research carried out in the 1970s had already shown that the decrease in children's autonomy has important consequences on the development of their spatial abilities (Hart, 1979).

Walking independently means, for children, acquiring a more detailed and integrated knowledge of the context in which they move. This context often coincides with one's own neighbourhood and, more specifically, with the home-school route (link to Further Exploration #1). The degree of autonomy to be achieved by the child can be deduced from the fact that "during the journey, the child is called upon to solve problems, make decisions and implement choices" (Rissotto & Tonucci, 2002).

Children are not protected by restricting their freedom of movement and underestimating their abilities and knowledge but by being allowed to interact with their surroundings because knowledge of an environment produces a sense of security (Spencer & Blades, 1986).

Their way to school is a great entry point for talking with young people about the equal distribution of public space for all. Consider children the experts on how to redesign streets in order for them to get to school actively and safely. Tactical Urbanism (link to Further Exploration#3) is a worldwide movement with interventions to make the streets safer but also more fun and, foremost, give urban space back to the people (Ikiz, 2023). This kind of participative, grassroots approach to creating a more socially and ecologically sustainable city can empower children to express themselves, their wishes and needs in the public space.

Source: Alessandra Grasso, Sant'Agata di Puglia

Attention Slow Down. In this village children still play in the street

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM, learning area "Life in Community":
- Similarities and differences between people / between children and adults
- Passions, talents, dealing with disabilities
- Reflection on own strengths and weaknesses

SUBJECT: Ethics, Learning Area "Togetherness"
- Coexistence of the generations

SUBJECT: Science lessons / STEM, Learning Area "Living and learning together"
- Getting to know the local/regional environment (school and school grounds, public facilities around the school and residential environment, traffic routes)
- Assessment/evaluation of local conditions
- Assessment/evaluation of own and other mobility concepts (transport-oriented, social, ecological)

SUBJECT: Languages
- Working with written texts: comprehension and reproduction of meaning (use of texts about these topics)

3.3 CITY OF DIVERSITY

The public space is not experienced by everyone in the same way. Different factors like ethnical and socioeconomic background, religion, gender, abilities and age affect how we interact with our urban surroundings. When it comes to mobility in the city, this becomes obvious: Moving safely can be highly dependent on the city's infrastructure, like lighting or wheelchair accessibility, but also on public transport costs or how lively (or deserted) a place is (link to Further exploration #4).

This is why the first step in building a strong community is to recognise our different challenges and not diminish them. In order to do so, we have to listen to one another so that, eventually, through dialogue, we embrace our differences and work together on taking down barriers and making our neighbourhoods and public spaces great for everyone.

When diverse types of food, art, music, traditions and cultures are represented in the public space, it comes alive for the better. A transcultural city is based on managing diversity as a resource. Being exposed to diverse experiences or ideas helps us develop what neuroscientists call "cognitive flexibility". Developing and maintaining cognitive flexibility benefits individuals by supporting learning and growth, enhancing interpersonal relationships and facilitating adaptation to change.

Besides those individual benefits, embracing diversity is our indispensable obligation in a democratic pluralistic society. It ensures fair representation, inclusion, social cohesion, and the protection of human rights. It strengthens the democratic system by reflecting the complexity and richness of the society it serves.

School communities are predestined to train those democratic competencies within young people (link to Further exploration #5). By fostering an atmosphere of mutual respect and understanding where all students feel valued and respected, schools can address potential challenges that may arise from diversity and set an example for wider communities.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM, learning area "Life in Community":
- Similarities and differences between people / between children and adults
- Passions, talents, dealing with disabilities
- Reflection on own strengths and weaknesses
- Encountering cultural diversity

SUBJECT: Ethics, Learning Area "Togetherness"
- Coexistence of the generations
- Coexistence of cultures

SUBJECT: Science lessons / STEM, Learning Area "Living and learning together"
- Getting to know the learning and the local environment

Credit: Street Lab, https://www.streetlab.org/

3.4 CREATE YOUR CITY

There is an international movement of people who share the belief that the citizens who live in a neighbourhood are actually the experts on how it should be shaped. This movement is called placemaking and is a participative concept of urban planning. Expressing the diversity of a community, creating inclusivity for everyone to thrive and challenging the common sight of urban spaces are the objectives of the placemaking movement.

In strengthening the tie between people and the places they share, the placemaking methodology focuses on the collaborative process between public and private actors in both the design and management phases. This approach reveals the power that a shared vision can have in creating quality spaces that contribute to people's well-being, exploiting their potential, be they parks, city centres, squares, streets, neighbourhoods, markets, campuses or public buildings.

If children are involved in placemaking, it provides them with a new and exciting way of confronting the world they live in, studying it, entering into a profound relationship with it and trying to improve it. This involvement of young people not only improves urban planning outcomes towards more sustainable ways but it equips children with competencies of ownership and self-efficacy that are indispensable if we want to raise active citizens. In recent years, city planning professionals have taken children extremely seriously as agents of change and allow for participatory processes that involve children in shaping urban spaces (See further explorations #5). With their drive to explore, out-of-the-box thinking and creative abundance, children can become the designers of their own future.

Placemaking strategies can be implemented with little or no budget and take very different shapes: From installing places to sit in the urban space and therefore encouraging interpersonal exchange to creating playable spaces that give opportunities for children to play outside, even in dense neighbourhoods. From bringing back natural spaces into the city by guerrilla gardening to artistic interventions that give a wall, a fence, a bumper or the asphalt a make-over. From making music on the street to public dance classes, all of those strategies can bring diversity to the streets, make cities more sustainable and most importantly, more liveable for their inhabitants.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Art, Learning Area "Physical-Spatial Design"
- Experimenting with found materials or objects
- Exploring outdoor spaces and their function
- Designing exterior spaces
- Form and function of the built environment: architecture

SUBJECT: Science lessons / STEM, learning area "Encountering space and time"
- Getting to know the local/regional environment (school and school grounds, public facilities in the school and residential environment, traffic routes)
- Assessment/evaluation of local conditions
- Assessment/evaluation of own and other mobility concepts (transport-oriented, social, ecological)

SUBJECT: various (Ethics; Languages; Science), "Democracy & society"
- Citizenship and the constitution
- Possibilities of participation in society

VISIONARY BOX

Cremona in Italy

Progetto Piedibus – The Walking School Bus Project in the Municipality of Cremona

The Piedibus in Cremona was born in 2006 and since then has given young school children the opportunity to walk to school together with an adult along several routes with fixed pick-up times.

The project started, when at the end of a workshop involving two primary schools, parents reflected on the problems related to children's mobility to and from school. A working group was formed that carried out an analysis of safe and dangerous spots in the neighbourhood regarding the traffic. With the organisational support from the municipality, parents took the lead in the conception and design of potential routes.

From the educational point, the benefits of the Walking School Bus are obvious:

- increase of cognitive skills
- socialisation
- daily physical exercise
- preparation future autonomy
- awareness of doing something useful for the environment (as opposed to driving by car)

The Piedibus is also a tool that facilitates collaboration between the school and the neighbourhood surrounding it and can activate resources available in the local community: grandparents, the elderly, neighbourhood committees, secondary school children, all of whom can accompany and collaborate. The Piedibus is an opportunity for community and integration between parents and children with different backgrounds. A significant experience of Piedibus as a tool for integration was realised at Boschetto primary school, where a group of young refugees from sub-Saharan countries were involved in the Piedibus and connected activities in the neighbourhood, activating a welcoming atmosphere and mutual exchange.

Website: https://www.comune.cremona.it/node/421583

Piedibus Cremona Municipality

FURTHER EXPLORATION

The walking school bus is a creative solution for bringing kids to school safely without using cars. It has been adopted by schools and communities world-wide (see also Visionary Box) and can be implemented relatively easily. Check out those resources, that guide you from the first idea to actually starting one:

North Carolina University. (n.d.). The basics. Walking School Bus.
http://www.walkingschoolbus.org/

The ultimate guide to involving children in placemaking is Victoria Derr's and Louise Chawla's book Placemaking with Children and Youth. It provides a framework for how to implement participatory practices with children and provides inspirational case studies from all over the world.

Derr, V. and Chawla, L. (2018). Placemaking with Children and Youth: Participatory Practices for Planning Sustainable Communities. New Village Press, New York.

Lighter, Quicker, Cheaper (LQC) is a placemaking concept that encourages simple community-driven urban interventions to transform public spaces. The website samples case studies from all over the world, where little measures help build community and inclusivity:

Lighter quicker cheaper - project for Public Spaces. Home - Project for Public Spaces. (n.d.).
https://www.pps.org/gps/lqc

The Green Urbanist is a podcast for everyone interested in how cities can participate in fighting climate change, but also how this process would make cities more inclusive. The episode recommended here, deals with the intersection of mobility, sustainability, social justice and disability rights:

#40: Disability mobility with Anna Zivarts, Abby Griffith and Micah Lusignan (disability rights washington). Green Urbanist Podcast. (2022, February 14).
https://greenurbanistpod.com/episode/40-disability-mobility-with-anna-zivarts-abby-griffith-and-micah-lusignan-disability-rights-washington

Anti-Bias Leaders is a platform from educators in the USA who teach parents, educators and teachers about anti-bias education from an early age on. The platform provides a guidebook and further free resources on classroom strategies and a 48-min highly worth-seeing documentary on teachers' experiences in implementing anti-bias education:

Reflecting on anti-bias education in action: The early years. Anti. (2023, April 12).
https://www.antibiasleadersece.com/the-film-reflecting-on-anti-bias-education-in-action/#

CONNECTED ACTIVITIES

Missing

Module 4

TREE FRIENDS

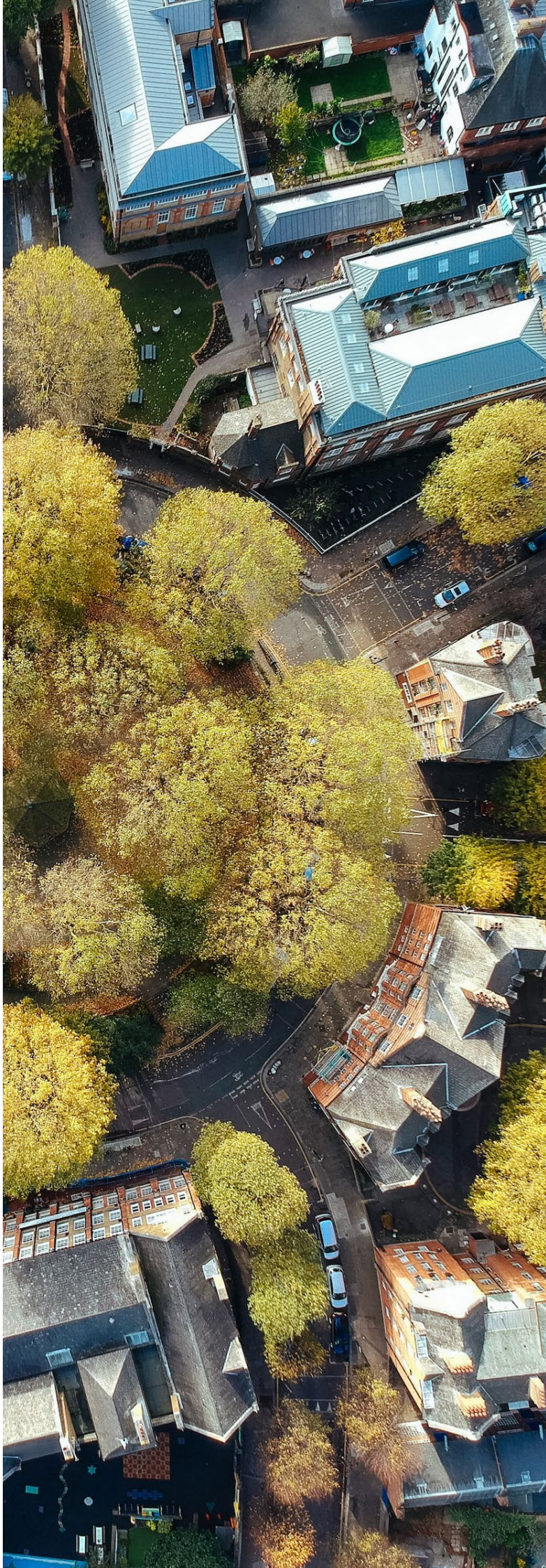
> The best time to plant a tree is 10 years ago; the second-best time is now.
>
> (Chinese proverb)

4. INTRODUCTION

In recent years, the importance of integrating nature into urban environments has gained significant attention, and trees have gained recognition as vital components of urban landscapes. As the world experiences rapid urbanisation, there is fierce competition for urban space. Still, for environmentalists, urban planners, and policymakers, trees in cities have become a critical consideration, as they provide many benefits that extend beyond their aesthetic appeal, contributing to urban areas' overall health, sustainability, and liveability (link to Further Exploration #1).

The concept of urban forestry, which involves cultivating and managing trees in urban settings, has evolved as cities strive to strike a balance between concrete jungles and green havens. This module delves into the significance of trees in cities, exploring the various roles they play and the benefits they offer to both the environment and the people who inhabit these urban spaces. From mitigating the effects of climate change to improving air quality and providing recreational spaces, trees have proven to be integral to the well-being of urban communities (link to Further Exploration #2).

In this module, we will explore the multifaceted aspects of urban trees, including their ecological importance, the challenges they face in urban environments, and innovative approaches to promoting healthy urban tree populations. By conveying the value of trees in cities to young people, educators can empower students to become environmentally conscious individuals who actively contribute to a sustainable future. Together, we can inspire the next generation of tree friends, fostering a love for nature and a commitment to its protection (link to Further Exploration #3).



4.1 AIR TO BREATHE

In the hustle and bustle of modern urban life, it's easy to overlook the silent heroes that stand tall amidst the concrete jungle - trees. These majestic beings play a pivotal role in maintaining the air quality of our cities, and their significance for clean air cannot be overstated.

Oxygen production is one of the most fundamental roles of trees in urban environments. Through photosynthesis, trees convert carbon dioxide into oxygen, which is essential for all life on earth. A single mature tree can produce enough oxygen to support two human beings for a year. As cities grow and the demand for clean air intensifies, the importance of trees as oxygen generators becomes increasingly apparent.

Furthermore, trees act as natural air filters. Their leaves, bark, and roots trap and absorb various atmospheric pollutants, such as carbon monoxide, sulphur dioxide, and nitrogen dioxide. Additionally, they capture particulate matter like dust and pollen, which can be harmful to respiratory health when inhaled. By doing so, trees contribute significantly to reducing air pollution in urban areas.

Trees are also crucial players in the fight against global climate change. They act as carbon sinks, absorbing carbon dioxide from the atmosphere and storing it as carbon in their trunks, branches, and roots. This process, known as carbon sequestration, helps reduce the overall concentration of greenhouse gases in the air, mitigating the effects of climate change.


Credit: Freepik.com

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM

- Basic knowledge about trees (characteristics, differentiation, knowledge of regional species, seasonal changes etc.)
- Essential properties of the air and their importance for (human) life
- Measures to protect natural resources
- Phenomena in the environment that are a consequence of the negative influence of man (example: climate change, global warming, greenhouse effect, acid rain, damage to the ozone layer, extinction of endangered species of plants and animals)
- Human activities for the protection of the environment

SUBJECT: Arts - Creative expression and appreciation

- Artistic production of works from recycled material
- contribution of art and other forms of cultural expression to understanding and changing the world by expressing own ideas, experiences and emotions (individual or collective)

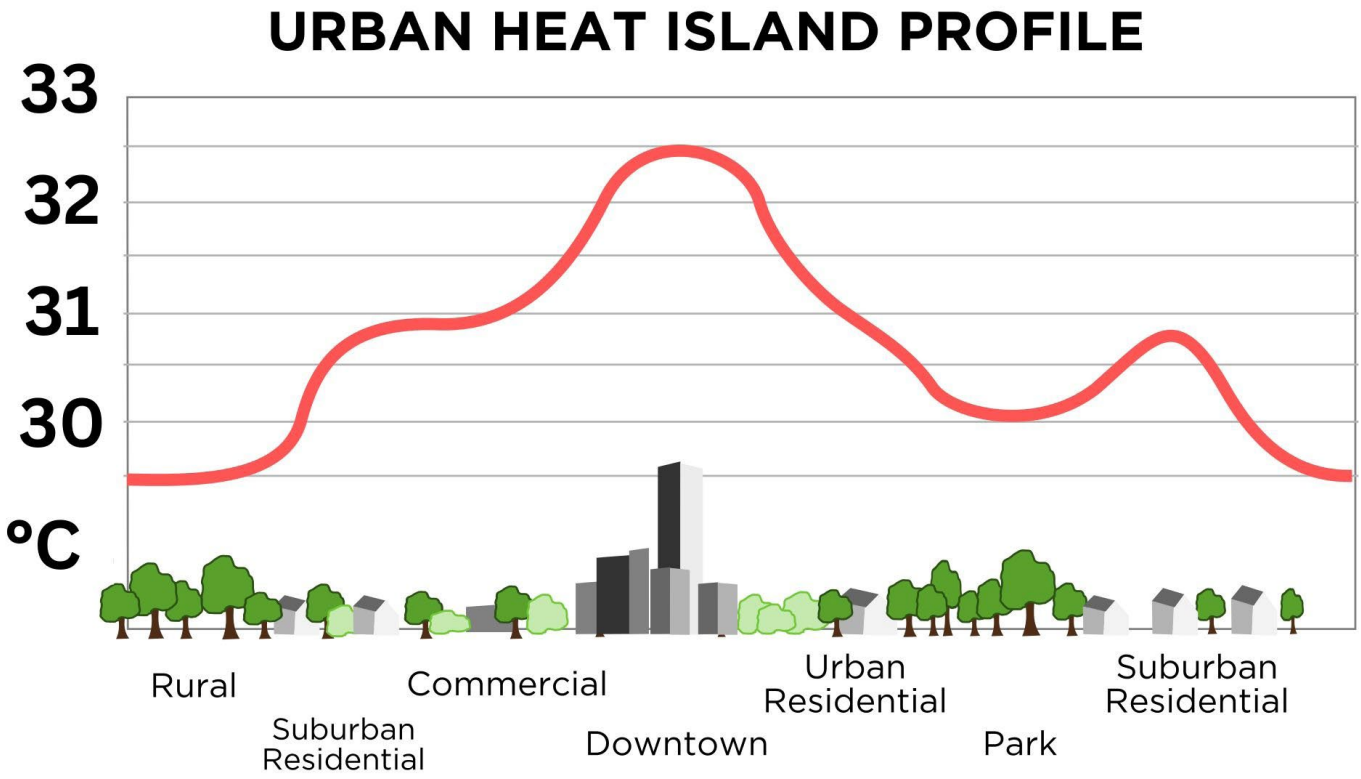
4.2 GIMME SHADE!

Shade is vital in mitigating the effects of excessive heat and sun exposure. It provides relief from the sun's rays, reducing the risk of heat-related illnesses and creating more comfortable outdoor spaces. Shade also helps to cool buildings, reducing the need for air conditioning and energy consumption.

Trees provide this kind of natural cooling by shading streets, sidewalks, and buildings. This helps lower temperatures in urban areas, combating the Urban Heat Island effect.

Urban heat islands, characterised by higher temperatures in cities compared to their surrounding rural areas, are a growing concern due to climate change and extensive urbanisation. It occurs as metropolitan areas and towns replace natural vegetation and green spaces with concrete structures, pavements, and buildings. Trees provide shade and help cool down the surroundings through a process called transpiration. Their leaves release water vapour into the air, which cools the immediate environment, making cities more habitable and reducing the energy required for air conditioning.

Mechanism of the urban heat island effect: the densely-built downtown areas tend to be warmer than suburban residential areas or rural areas.



CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM

- Effects of sunlight
- Weather phenomena, temperature, climate
- Measures to protect natural resources
- Phenomena in the environment that are a consequence of the negative influence of man (example: climate change, global warming, greenhouse effect, acid rain, damage to the ozone layer, extinction of endangered species of plants and animals)
- Human activities for the protection of the environment

SUBJECT: Arts - Creative expression and appreciation

- Artistic production of works from recycled material
- contribution of art and other forms of cultural expression to understanding and changing the world by expressing own ideas, experiences and emotions (individual or collective)

SUBJECT: Languages

- Narrating and describing (using appropriate vocabulary and using present and past tense verbs, describing people, characters, plants, animals, natural phenomena and landscapes, expressing thougths and feelings)


Credit: Freepik.com

4.3 RAIN ON ME!

As climate change has a significant impact on weather patterns, the intensity and frequency of storms and heavy rain may increase in the future. For cities, this already entails several challenges today, from overflooding of drainage systems to damage to infrastructure and properties to the disruption of services.

In the case of extreme weather events, trees play a crucial role in managing stormwater in urban and natural environments. They help mitigate the negative impacts of storms and heavy rain by providing several key benefits:

The canopy of trees intercepts rainwater, reducing the direct impact of rainfall on the ground. This helps prevent soil erosion and minimises soil compaction that can occur when raindrops hit bare ground. Furthermore tree roots absorb water from the soil, reducing surface runoff. This process helps recharge groundwater aquifers and decreases the amount of water flowing directly into storm drains and water bodies.

Generally trees store a significant amount of water in their tissues, including leaves, stems, and roots. This stored water is gradually released after the storm, helping to regulate the flow of water into nearby streams and rivers. This can reduce the risk of flash floods.

By binding soil particles together, trees prevent erosion and soil loss during heavy rainfall. This helps maintain the integrity of the soil, which in turn aids in stormwater management.

In addition, as stormwater percolates through the soil around tree roots, it is filtered and purified. This way, trees can remove pollutants and excess nutrients from the water, improving water quality before it reaches natural water bodies.

Street trees offer a wide range of benefits that directly impact the quality of life in urban areas, and educating young people about these benefits can help them appreciate their significance.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM

- Essential properties of water, cycle of water in nature
- Weather phenomena, temperature, climate
- Measures to protect natural resources
- Phenomena in the environment that are a consequence of the negative influence of man (example: climate change, global warming, greenhouse effect, acid rain, damage to the ozone layer, extinction of endangered species of plants and animals)
- Human activities for the protection of the environment

SUBJECT: Arts - Creative expression and appreciation

- Artistic production of works from recycled material
- contribution of art and other forms of cultural expression to understanding and changing the world by expressing own ideas, experiences and emotions (individual or collective)

SUBJECT: Languages

- Narrating and describing (using appropriate vocabulary and using present and past tense verbs, describing people, characters, plants, animals, natural phenomena and landscapes, expressing thougths and feelings)
- Working with written texts: comprehension and reproduction of meaning (use of texts about these topics)

SUBJECT: Music

- Songs about rain
- Creating noises and sounds, making themes sonorous

4.4 HOME FOR BIRDS AND BUGS

Urban trees serve as habitats for various birds, insects, and small animals, contributing to urban biodiversity. A rich urban ecosystem with diverse plant and animal life is essential for maintaining the environment's overall health.

How does a tree contribute to that?

First of all, a tree is habitat for various species. They provide homes, shelter, and nesting sites for a wide range of organisms, including birds, insects, mammals, and fungi. The complex structure of a tree, with its leaves, branches, and cavities, offers niches and microhabitats for different species.

Furthermore, trees produce fruits, nuts, seeds, and nectar that serve as essential food sources for many wildlife species, such as birds, mammals, insects, and even other plants. Some trees are particularly important in this regard, like oak trees that support numerous wildlife species.

Reciprocally, many tree species rely on pollinators such as bees and butterflies for reproduction. By attracting these pollinators, trees indirectly support the biodiversity of other plant species that also depend on these pollinators.

In addition, trees improve soil fertility by dropping leaves and needles that decompose and enrich the soil with organic matter. Healthy soils support a diverse range of organisms, including earthworms, microbes, and fungi.

By caring for our trees, we provide our animal neighbours with a suitable habitat and help maintain the delicate balance of nature and contribute to a thriving ecosystem (link to Further Explorations #4).

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM
- Habits of native birds throughout the year
- Way of life of selected native animal species
- Importance of the tree habitat
- Nature observations
- Measures to protect natural resources
- Human activities for the protection of the environment

SUBJECT: Arts - Creative expression and appreciation
- Artistic production of works from recycled material
- contribution of art and other forms of cultural expression to understanding and changing the world by expressing own ideas, experiences and emotions (individual or collective)

SUBJECT: Languages
- Narrating and describing (using appropriate vocabulary and using present and past tense verbs, describing people, characters, plants, animals, natural phenomena and landscapes, expressing thougths and feelings)

SUBJECT: Music
- Songs about nature, birds and bugs

FURTHER EXPLORATION

Peter Wohlleben is a German bestselling authour who brought the secret lives of trees into the book charts world-wide. The young readers edition of his book is a treasure chest for teaching nature's wonders to children:
Wohlleben, P., Tanaka, S., Billinghurst, J., & Wohlleben, P. (2019). Can you hear the trees talking?: Discovering the hidden life of the forest ; Young Readers Edition. Greystone Kids.

Andrea Curtis and Pierre Pratt provide a picture book for children on the benefits of tree-rich parks and streets in the city with great illustrations:
Curtis, A., & Pratt, P. (2020). A forest in the city. CNIB.

This elementary school in Berkeley, California is engaging their students in planting micro forests on the school grounds. Meet science teacher Neelam Patil and her students and get inspired to advocate for urban forests:
YouTube. (2022, April 28). Berkeley School Forest: San Fransisco, USA. YouTube.
https://www.youtube.com/watch?v=gpRhDYAGUMw
Markovich, A. (2022, December 8). Berkeley schools' "pocket forests" are taking root. Berkeleyside.
https://www.berkeleyside.org/2022/12/08/miyawaki-pocket-forests-berkeley-unified-school-district

Pamela Hickmann and Zafouko Yamamoto (Illustrations) created a children's book on trees being a habitat for so many animal species. It follows life on and in an old oak tree through the seasons: *Hickman, P., & Yamamoto, Z. (2021). A tree is a home. Kids Can Press.*

CONNECTED ACTIVITIES

Air to Breathe
Collective planting of young trees
Pollution station

Gimme Shade!
Planting seeds
Making shades from paper

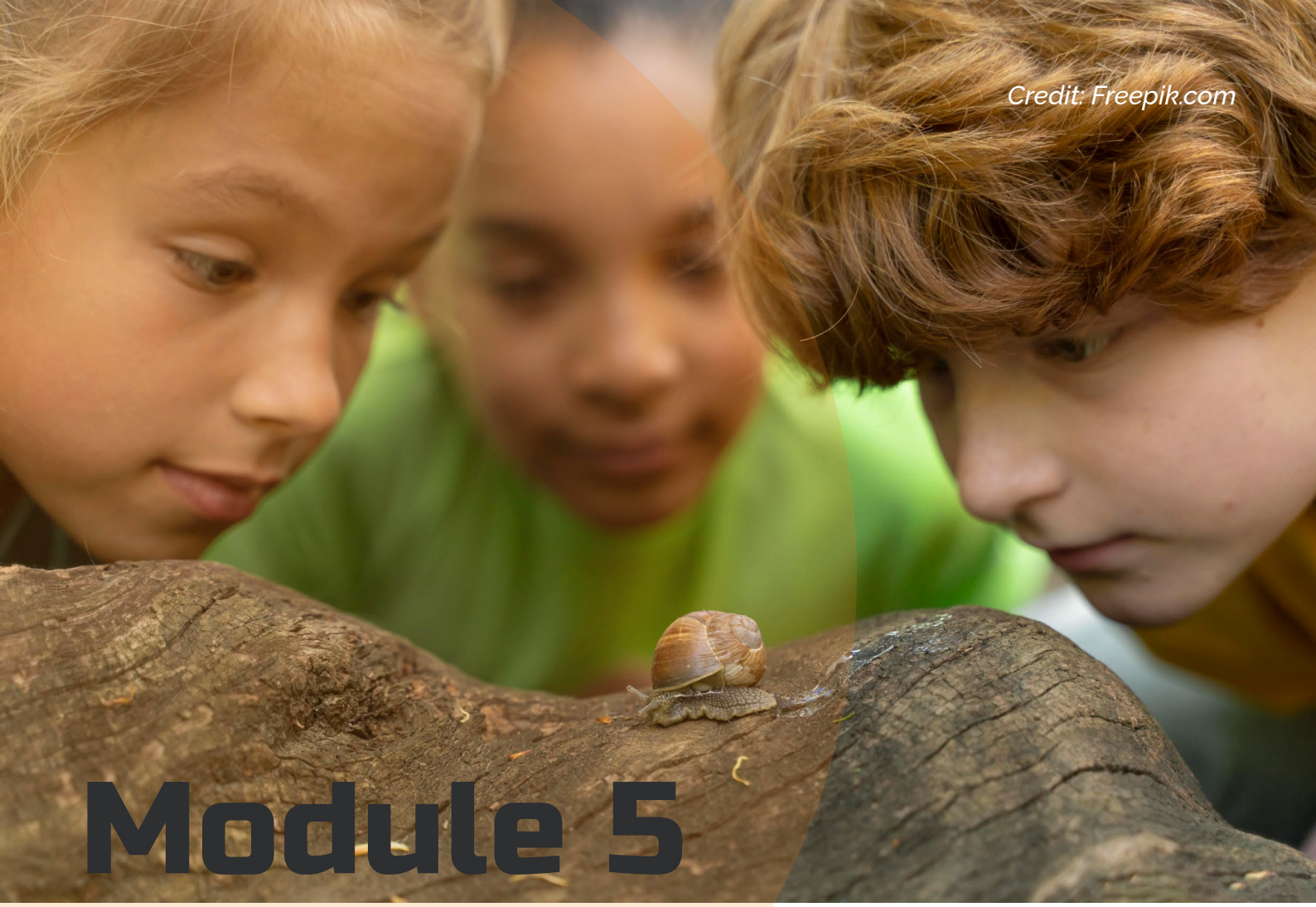
Rain on me!
How dows it rain
Raindrops
The rain in the clouds

Home for Birds and Bugs
Bug hotel
Hotel for butterflies
Home for birds

VISIONARY BOX

North Macedonia

This activity, planting trees, is made a national holiday, “Day of the tree”. Every year every school in North Macedonia has actions for planting trees, every school gets a donation of trees and they plant them in the school yard or some place in the city that needs greenery. The schools organise actions and they go to a place that needs greenery and plant trees.



Credit: Freepik.com

Module 5

ANIMAL NEIGHBOURS

> It is not an act of kindness to treat animals respectfully.
> It is an act of justice.
>
> (Tom Regan)

5. INTRODUCTION

Promoting animal biodiversity in cities is essential for creating sustainable and healthy urban environments. Urbanisation often leads to habitat destruction and fragmentation, which can negatively impact wildlife populations and the balance of our ecosystem. Creating sustainable cities that prioritise animal wildlife not only contributes to biodiversity conservation but also enhances the overall quality of life for residents by providing opportunities for wildlife observation and interaction. It's a win-win approach that promotes the well-being of both human and animal populations in urban environments.

Fostering a conservation attitude in children through nature contact is crucial for building a generation of environmentally conscious and responsible individuals, and creating opportunities for animal encounters is one of the most successful ways of doing so. Young people can be easily involved in creating and maintaining urban wildlife habitats by planting native plants and providing food, water, and shelter for animals (Link to Further Exploration #4).

By bringing nature into children's direct environment, they can learn about the diverse wildlife that may be present in your area (from insects to birds and mammals), helping them better understand and appreciate the natural environment around them. Studying the wildlife up close can provide insights into how these animals contribute to the ecosystem, their roles in maintaining the balance of nature, and how they adapt to human-dominated landscapes.

Whether your learners are curious about the birds that visit the window sill of their classroom, the squirrels that scurry along the fence, or the insects buzzing around your school yard, the school environment can nurture this curiosity by creating interactive wildlife-friendly gardens, attracting beneficial insects, and planting native species to enhance the ecological balance in young people's immediate surroundings (link to Further Exploration #1).

5.1 HOME TO LIVE

An animal's home, often called its habitat, is the natural environment or surroundings in which it lives and fulfils its various needs, such as finding food, water, shelter, and reproducing. Different animals have evolved to thrive in specific types of habitats based on their adaptations and requirements. In cities, the living conditions have been increasingly challenged.

One significant issue is habitat loss. As cities expand, natural habitats give way to buildings, roads, and other infrastructure, a process known as habitat fragmentation. This leaves wildlife with less space to live and find food, ultimately leading to population declines.

The urban environment can be challenging for wildlife, and ensuring that animals have access to suitable shelter can significantly improve their chances of survival and well-being. A lot of the measures to counteract habitat loss can be implemented by young people. Therefore, the school premises could be an ideal exploration space for creating an environment where people and animals can thrive.

This benefits animals, but it also provides an optimal learning experience for exploring the animal world and understanding natural processes like pollination, which are crucial for humans' quality of life. Gaining insight into the complex interrelation of human and animal life is much more effective when experienced in a direct, interactive and hands-on way (Link to Further Explorations #2). Another positive side-effect of bringing wildlife into children's arms' reach is overcoming alienation from nature, which is common with children who grow up without access to natural spaces. Consequently, many young people experience fear or even disgust when confronted with insects, for example. Transitioning these negative emotions into stewardship through direct encounters can be a game-changing achievement towards their commitment to protecting the environment (Link to further exploration #3).

What are the measures that can foster wildlife in children's direct environment?

1. Preserve and protect natural habitats like parks, forests, wetlands, and green spaces, which offer nesting sites, protection, and food.

2. Install birdhouses and nesting boxes in urban green areas to support bird populations.

3. Place bat boxes on buildings or in parks to provide roosting sites for bats, aiding insect control.

4. Design gardens with native plants to create natural shelters and food sources for various creatures.

5. Create rock or brush piles to mimic natural habitat features for reptiles, amphibians, and small mammals.

6. In regions with burrowing animals (rabbits, squirrels), offer artificial burrows or tunnels for shelter.

7. Install hedgehog houses or ensure safe garden spaces in areas with hedgehog populations.

Providing shelter for animals in cities fosters peaceful coexistence between humans and wildlife, promoting biodiversity and enhancing the overall quality of life in urban areas.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM
- Habits of native birds throughout the year
- Habits of selected native animal species
- Habitat meadow and its importance for animals and humans
- Forest habitat and its importance for animals and people
- Nature observations
- Measures to protect natural resources
- Human activities for the protection of the environment

SUBJECT: Arts - Creative expression and appreciation
- Artistic production of works from recycled material
- contribution of art and other forms of cultural expression to understanding and changing the world by expressing own ideas, experiences and emotions (individual or collective)

SUBJECT: Languages
- Narrating and describing (using appropriate vocabulary and using present and past tense verbs, describing people, characters, plants, animals, natural phenomena and landscapes, expressing thougths and feelings)
- Working with written texts: comprehension and reproduction of meaning (use of texts about these topics)

5.2 SPACE TO MOVE AND PLACE TO THRIVE

Even if some green spaces exist in cities, they are often fragmented, making it challenging for wildlife to find suitable habitats and migrate between them. Wildlife corridors, also known as ecological corridors or green corridors, are connected areas of habitat that facilitate the movement of wildlife between isolated patches of suitable habitat. These corridors are essential conservation strategy components, especially in urban and fragmented landscapes.

Children can play a meaningful role in supporting urban wildlife corridors and engaging in conservation efforts. Here are some age-appropriate ways your learners can get involved:

1. Connect children with urban wildlife through outdoor exploration: Spend time with them in nearby parks, green spaces, and natural areas. Explore these areas to observe and appreciate urban wildlife like birds, insects, and small mammals. Teach them to respect these creatures and their habitats.

2. Involve children in gardening activities: Planting native species in the family garden, the school yard or participating in community garden projects can create wildlife-friendly habitats right at home. Explain how this benefits local wildlife by providing food and shelter.

3. Bird watching to introduce children to the world of urban wildlife: Set up bird feeders and birdhouses in the yard or balcony to attract and observe local bird species. Teach children about the different birds that visit and their behaviours.

4. Encourage children to keep a nature journal or scrapbook to document their observations of urban wildlife: They can make sketches, take notes, and even capture photographs of the creatures they encounter. This journaling activity fosters a deeper connection with nature and sharpens their observation skills.

Little measures, that young people can undertake can play an important role in fostering peaceful cohabitation with the animal world. For children to pay attention to the processes of nature around them - where birds nest, what they need to subsist in winter, what kind of shelter hibernators need – nurtures childrens' curiosity but also empathy for, and connection with urban wildlife (Link to Further Exploration #5). This can inspire a lifelong commitment to conservation and a sense of stewardship for the natural world.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM
- Habits of native birds throughout the year
- Habits of selected native animal species
- Habitat meadow and its importance for animals and humans
- Forest habitat and its importance for animals and people
- Nature observations
- Measures to protect natural resources
- Human activities for the protection of the environment

SUBJECT: Arts - Creative expression and appreciation
- Artistic production of works from recycled material
- contribution of art and other forms of cultural expression to understanding and changing the world by expressing own ideas, experiences and emotions (individual or collective)

SUBJECT: Languages
- Narrating and describing (using appropriate vocabulary and using present and past tense verbs, describing people, characters, plants, animals, natural phenomena and landscapes, expressing thoughts and feelings)
- Working with written texts: comprehension and reproduction of meaning (use of texts about these topics)

SUBJECT: Physical education
- Types of movement

5.3 FOOD TO INDULGE

Biodiversity, the incredible variety of life forms on our planet, plays a critical role in ensuring our access to an abundant and nutritious food supply. When we think about the delicious foods we enjoy, like fruits, vegetables, grains, and meat, it's important to recognise that they rely on a rich tapestry of plant and animal species working together.

Take, for example, the indispensable role of pollinators such as bees and butterflies. They flit from flower to flower, transferring pollen and enabling the production of the fruits and vegetables we enjoy. This process ensures our favourite foods and enhances their flavour and quality.

Fostering pollination in cities is crucial for supporting urban biodiversity, enhancing food production, and ensuring the reproduction of many plants. Several strategies can promote pollination in urban areas:

1. **Plant Pollinator-Friendly Gardens:** Choose native plants that bloom throughout the seasons, with diverse flower shapes and colours to attract bees, butterflies, and hummingbirds. Avoid harmful pesticides.

2. **Create Pollinator Habitat:** Set aside areas for pollinator-friendly plants like wildflower meadows and shrubs. Include trees and shrubs that offer nesting sites and shelter.

3. **Provide Water:** Shallow water sources like birdbaths or ponds with perches help pollinators drink and cool off.

4. **Reduce Light Pollution:** Diminish artificial night time lighting to avoid disorienting nocturnal pollinators like moths and bats.

5. **Leave Some Areas Wild:** Keep parts of parks or green spaces untamed to support ground-nesting bees and other pollinators.

6. **Plant Edible Gardens:** Grow fruits and vegetables like tomatoes, squash, and berries that rely on pollinators, supporting both pollinators and local food production.

Pollinators such as bees, bats, and butterflies are like superheroes of the natural world. They play a crucial role in helping plants grow, leading to an abundance of flowers, fruits, and vegetables that we all love. Likewise, birds play a crucial role in maintaining and enhancing biodiversity in various ways. Their contributions to ecosystems are diverse and significant, and they help ensure the overall health and balance of natural environments. One of the primary roles of birds in biodiversity is seed dispersal. Many bird species, especially frugivorous (fruit-eating) birds, assist in the dispersal of seeds. They consume fruits and then excrete the seeds in different locations, helping to regenerate plant species and maintain forest and ecosystem diversity. Therefore, birds are often considered indicator species because changes in their populations and behaviors can provide early warnings of environmental disturbances and habitat degradation.

Providing young people with the tools to help these species will enable them to develop a deep connection with nature and gain confidence in their ability to make a positive impact on the environment.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM
- Habits of native birds throughout the year
- Habits of selected native animal species
- Life cycle of native plants
- Pollination (importance of insects, impact on humans and nutrition)
- Nature observations
- Measures to protect natural resources
- Human activities for the protection of the environment

SUBJECT: Arts - Creative expression and appreciation
- Artistic production of works from recycled material
- contribution of art and other forms of cultural expression to understanding and changing the world by expressing own ideas, experiences and emotions (individual or collective)

SUBJECT: Languages
- Narrating and describing (using appropriate vocabulary and using present and past tense verbs, describing people, characters, plants, animals, natural phenomena and landscapes, expressing thoughts and feelings)
- Working with written texts: comprehension and reproduction of meaning (use of texts about these topics)

FURTHER EXPLORATION

Rewild My Street is a British platform that guides people wishing to adapt their homes, gardens and streets to encourage wildlife - and stop cities going grey. Upon signing up for free you will get accessible tips for rewilding even small urban spaces:
Greening city streets for Wildlife. Rewild My Street. (2023). *https://www.rewildmystreet.org/*

This panel by the People & Pollinators Action Network (PPAN) dives into the interconnectedness of human health and healthy pollinator habitat. Louise Chawla is an expert on the benefits of nature contact for children:
YouTube. (2021, March 13). Episode #102 - Julie Morris and Louise Chawla, People & Pollinators Action Network (PPAN). YouTube. https://www.youtube.com/watch?v=sckOlwgh6RM

Shabazz Larking wrote a children's book with great artwork on why we need to help bees even though they sting:
Larkin, Shabazz: The Thing About Bees. A Love Letter. Readers to Eaters, 2019.

Climate Kids is a platform that provides tools, trainings and resources for young people and their teachers and parents to learn about protecting the environment. In the pollinator section there is plenty of activities, background information, work sheets and storytelling on why those pollinators should have our back:
Pollinators: Climate kids connects. Climate Kids. (2023). https://www.climatekids.org/pollinators

Watching beavers doing their thing in your neighbourhood? This is the new reality in some parts of London, where as part of a rewilding of streams, beavers are introduced into an urban setting. Explore how the Ealing Wildlife Project brings together humans and wildlife while giving nature the lead:
Bringing beavers back to London! Ealing Wildlife Group. (2023, August 25). https://ealingwildlifegroup.com/conservation-projects/bringing-beavers-back-to-london/

Here is a very informative article by The Guardian on that phenomenon:
Beavers to return to London as part of urban Rewilding. (2023, March 21). The Guardian. https://www.theguardian.com/environment/2023/mar/21/beavers-to-return-to-london-as-part-of-urban-rewilding

VISIONARY BOX

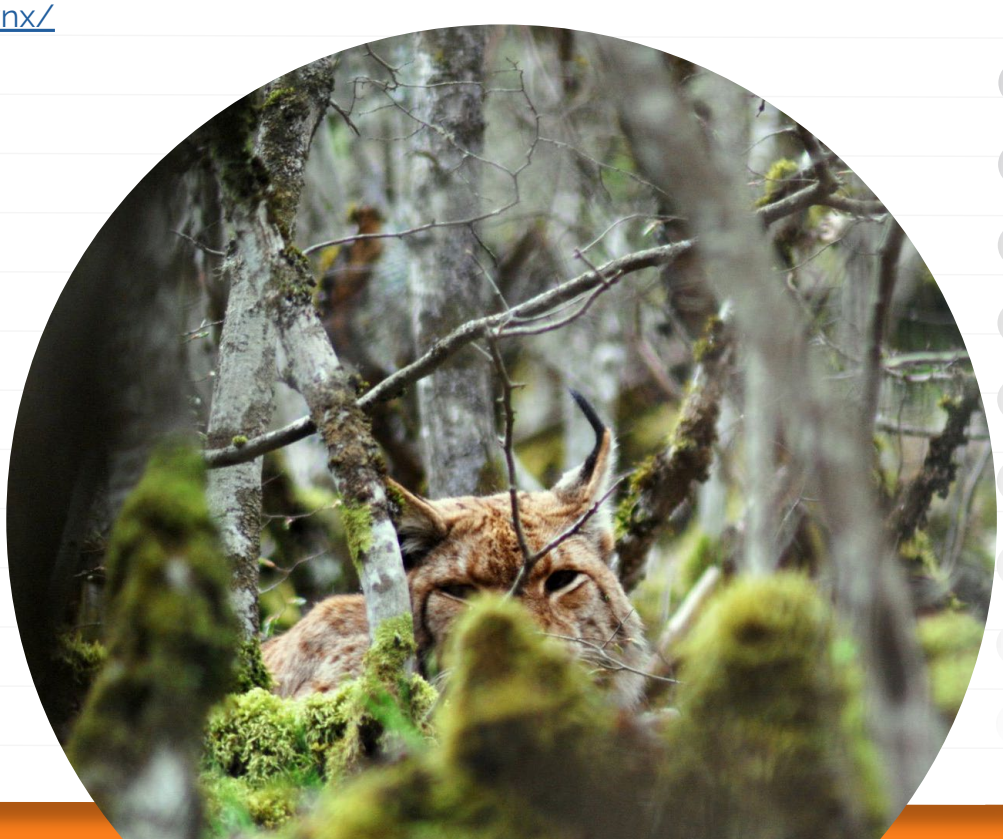
North Macedonia

Ten years ago, a significant milestone was achieved in the realm of wildlife conservation in the south-west Balkans when the first Balkan lynx named Marko was captured for scientific research purposes. This event marked a pivotal moment in the history of the Macedonian Ecological Society, Protection and Preservation of the Natural Environment in Albania, and Mavrovo National Park, as their joint effort transcended theory and ventured into practical fieldwork. Marko's capture near the village of Sence in Mavrovo National Park, Macedonia, initiated a year-long journey of scientific discovery.

Marko quickly became an icon in the conservation program and garnered recognition among both experts and the general public, stimulating interest in endangered wildlife and fascination for the diversity of species. His adventures were documented in films, and his captivating images graced the covers of numerous articles, leaflets, brochures, and posters. Despite his significant contribution to ecological knowledge and the insights gained from tracking him using GPS and VHF technology, Marko's story took a somber turn in early 2011 when he fell victim to poaching, highlighting the persistent threat faced by the fragile Balkan lynx population.

The memory of Marko continues to inspire and drive the conservation efforts aimed at protecting the dwindling population of these critically endangered felines. Observing wildlife's challenges and threats, such as habitat loss and climate change, instils a sense of responsibility in children. They may feel compelled to take action to protect the habitats and species they love.

Source: Macedonian Ecological Society. (2020, October 15). 10 years ago, on this day we captured the first balkan lynx. https://mes.org.mk/en/10-years-ago-on-this-day-we-captured-the-first-balkan-lynx/



CONNECTED ACTIVITIES

Home to Live

Outdoor activities: Making living spaces for the animals and bugs

Bug hotel

Hotel for butterflies

Homes for birds

Space to move and place to thrive

Outdoor activities: Exploring nearest pond, river or crick

Making insectarium

Exploring trees for homes for bugs

Food to indulge

Making feeders for birds, bugs and animals

Exploring home animals and what they do

Exploring wild animals

Credit: Freepik.com

Module 6

CITY FOR ALL SENSES

> I think ultimately, bringing more nature back into the city is a way to deal with urban sprawl and things like that. If the cities feel a little more natural, people like to live there more rather than moving out and dividing up another piece of land that shouldn't be touched.
>
> (Stone Gossard)

6. INTRODUCTION

Nature is a magical creation that surrounds us wherever we go. From tall trees that provide shelter and shade to birds singing melodious songs, nature is a gift we often take for granted, we do not think about the fact that we could lose it. However, in recent years, people have begun to pay more attention and become aware of the importance of nature in our lives. That is why it is very important to connect with nature, that is, to teach students from an early age about its importance.

Spending time in nature reduces stress and anxiety and improves our mood and our cognitive abilities. Nature can also inspire us to be creative, spark our imaginations, and inspire the creation of works of art, literature, and music.

The purpose of this module is to bring nature closer to the students, to our schools, homes, and cities. Students should explore nature by studying biodiversity, and ecosystems from the smallest microbes, plants, birds, insects, and animals. They should also know their role in pollination and natural pest control. They should realise that they are an important part of the food chain and essential to ecosystems. With different activities, students get to know nature better: They learn where our food comes from, what the parts of a plant are, how products of nature are used and processed, and how to make their own eco-sustainable garden. But they should also get to know about the loss of habitats, the destruction of forests, and the severe changes in weather and temperature caused by human-made climate change.

While spending more time outdoors, students can explore nature through observation and experimentation and experience it with all their senses through the rustling of leaves, pebbles, branches, feathers, seeds, etc. They should also gain extensive sensory experiences, including all their senses: smell, sight, hearing, feeling, observation and touch. However, it is equally important to teach them to be patient with nature and learn how to preserve nature and the environment, and what measures need to be taken to ensure that the wonders of nature are preserved for future generations.

Credit: Freepik.com


Credit: Freepik.com

6.1 DELICIOUS FOOD: GROWING FOOD IN THE CITY

Growing food increases green areas in the city, and gives more people access to healthy and high-quality food. Eating home-grown organic food is the key to a long and healthy life. We are increasingly aware of the development of serious diseases and increased mortality from the constant consumption of unhealthy food, as well as vegetables and fruits poisoned by polluted air and water. Planting and growing food in the city improves the air quality and stimulates the local economy. Each of us can be an example in the local community. Both adults and children can be involved -- students together with their teachers by creating Eco Gardens (organic school gardens), using recycling materials in school yards, halls and classrooms. Seedlings with various fruits and vegetables can be planted in the yards and on the roofs of the buildings, on the balconies, and in the yards. Local businesses will help the community economy by purchasing products from local producers. Various activities will increase the students' awareness to turn to nature from an early age. Humans and nature can and should be the best allies for a high quality of life. In addition to recycling and planting trees for clean air, eating healthy homemade food is also important for a long and healthy life (Link to Further Explorations #1 + #2).

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM

- Life cycle of native plants
- Pollination (importance of insects, impact on humans and nutrition)
- Mutual relations between animals and plants
- Soil habitat and soil conditions
- Abiotic factors (light intensity, temperature, humidity, atmospheric pressure, soil structure, water availability, air, pollution, altitude)
- Nature observations
- Weather observation and interpretation of weather forecast
- Measures to protect natural resources
- Human activities for the protection of the environment

SUBJECT: Gardening

- Cultivation of fruits, vegetables, herbs
- Construction and use of a greenhouse

6.2 POLLINATION PARADISE

Planting flowers of different shapes, sizes and colours in gardens, yards, and parks makes it easier for pollinators to locate their next meal. A variety of flowering plants ensures a reliable food supply. To increase the diversity and number of bees and other insects in cities, they need access to suitable habitats and nesting sites found in open soil, dead wood and wall cavities. Everyone can contribute to bringing pollinators back to cities. Good education and increased eco-awareness mean consciously planting flowers, seedlings and plants that attract bees and other pollinators. Old tree trimmings can easily be turned into flower plant pots, and we can re-use tin cans and glass jars, so they're more than just waste. With various activities, the teachers will educate and motivate their students and raise awareness of the importance of pollinators in the cities. The students are guided and become aware of the role that each of us receives from the moment of our birth, which is to be a caring, careful and responsible human being on planet Earth. This implies the conservation of natural resources, recycling, and forestation. It means also raising awareness of what we can do to help pollination and natural control of pests, reducing air pollution, and buying food grown on unpolluted soil and without pesticides (Link to Further Explorations #10 + #11).

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM
- Life cycle of native plants
- Pollination (importance of insects, impact on humans and nutrition)
- Mutual relations between animals and plants
- Nature observations
- Measures to protect natural resources
- Human activities for the protection of the environment

SUBJECT: Gardening
- Cultivation of fruits, vegetables, herbs

SUBJECT: Music
- Songs about nature, insects and bugs

6.3 SOUND VS. NOISE

Noise is harmful to the health of all living beings. How to make the city a quieter place to live in? In cities and urban areas, trees not only have various aesthetic advantages, but they also improve the quality of the air. Trees purify the air, create coolness and host birds and insects. They are homes, and habitats for various birds, insects and other types of animals. The planned planting of trees and plants is significant in reducing noise levels in urban areas, around main streets and in the places where we stay. Apart from planting trees and plants, awareness should be raised to use public transport and bicycles more frequently. Growing plants also connects community members. Educating children and adults about the consequences of noise and its negative effects on people and animals will contribute to positive results in reducing noise damage. Children will develop sustainable thinking and a vision for the future (Link to Further Explorations #3 - #6).

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM
- Relationships between ecological, social and economic systems
- Health and well-being (importance of silence and relaxation)
- Human activities for the protection of the environment
- Media education (creation of media products: recording of and working with sounds)

SUBJECT: Arts - Creative expression and appreciation
- Transforming sounds and tones into images

SUBJECT: Music
- Creating noises and sounds, sounding out themes
- Contrast of loud and quiet

Credit: Freepik.com

6.4 WICKED WEED

Biodiversity is the variety of life. It is essential for people's physical and mental health and well-being, economic prosperity, security, food security and human life and society in general. Biodiversity enables us to live healthy and happy lives. It provides us with various food and materials and contributes to the economy. Without a diversity of pollinators, plants, and good nutritious soil, our supermarkets would have far fewer products. The loss of biodiversity destabilises the ecosystems and the entire balance in nature, affecting people and their quality of life. Raising people's awareness to understand what a loss of biodiversity means for them, especially for their children's health, can be a very effective encouragement to change their habits. Children should understand the importance of biological diversity from an early age, and they will can realise this in their closest environment, in schools and homes. By restoring ecosystems, protecting the natural habitats of animals, plants and insects, rational consumption of natural resources, saving and purifying water, leading a sustainable lifestyle, and taking care of our energy, food and water consumption. We will increase the resilience of communities towards their vulnerability to environmental disasters, climate change and pollution and thus reduce the burden on nature.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science lessons / STEM

- Life cycle of native plants
- Knowledge about native plants
- Crops and weeds: Which plats have a "benefit" and for whom?
- Ecosystems and their importance
- Nature observations
- Measures to protect natural resources
- Human activities for the protection of the environment

SUBJECT: Languages

- Narrating and describing (using appropriate vocabulary and using present and past tense verbs, describing people, characters, plants, animals, natural phenomena and landscapes, expressing thoughts and feelings)
- Working with written texts: comprehension and reproduction of meaning (use of texts about these topics)

6.5 INTERACTING WITH NATURE

Connecting with nature positively impacts our health, social life and our communities. It encourages adults and children to have an active lifestyle. We reduce the amount of waste by reusing products or producing new products from recycled material. In this way, the pollution in the city is gradually reduced, which is a global problem today. Every teacher is a role model for every student. The activities in the sub-theme are easy to implement with younger students. Through implementing these activities, the students' creativity, ability to solve problems, practical learning through play, and awareness of the importance of a clean environment will be developed from a young age. Through shared experiences between teachers and students, the other entities in the educational institutions are involved in implementing activities for a cleaner city. By increasing awareness among children from a young age, the environment is preserved, and the quality of life in urban areas increases, which enables the revival of nature in the city. Humans will build a city that would be the ideal home for all beings.

CONNECTED TOPICS IN CURRICULUM

SUBJECT: Science
- Habits of native birds throughout the year
- Habits of selected native animal species
- Habitat meadow and its importance for animals and humans
- Forest habitat and its importance for animals and people
- Health and well-being (importance of movement and relaxation)
- Nature observations
- Measures to protect natural resources
- Human activities for the protection of the environment

SUBJECT: Arts - Creative expression and appreciation
- Artistic production of works from recycled material
- contribution of art and other forms of cultural expression to understanding and changing the world by expressing own ideas, experiences and emotions (individual or collective)

SUBJECT: Languages
- Narrating and describing (using appropriate vocabulary and using present and past tense verbs, describing people, characters, plants, animals, natural phenomena and landscapes, expressing thoughts and feelings)

SUBJECT: various (Science, Ethics, Physical education, team building)
- Excursions: Exploration of environments, movement in nature, observation of nature and urban life

FURTHER EXPLORATION

This resource provides schools with tips how to start a school garden and explains what benefits this brings:
How to start a School Garden: Your Complete Guide. Earth-easy Guides & Articles. (n.d.).
https://learn.eartheasy.com/guides/how-to-start-a-school-garden-your-complete-guide/

Explore how to start a productive, organic vegetable garden in your school or pre-school:
Vegetable gardening in schools and pre-schools. A Place of Learning. (n.d.).
https://www.aplaceoflearning.co.nz/courses/vegetable-gardening-in-schools-and-pre-schools/

Noise pollution can cause health problems for people and wildlife, both on land and in the sea. Find more information here:
Noise pollution. Education. (n.d.).
https://education.nationalgeographic.org/resource/noise-pollution/

Find more info on noise pollution here:
Encyclopædia Britannica, inc. (2023, September 5). Noise pollution. Encyclopædia Britannica.
https://www.britannica.com/science/noise-pollution

This educational article can be used by teachers in the educational process, teaching children that they can contribute to reducing noise pollution with their behaviour:
How to reduce noise pollution in homes. UK Construction Online. (n.d.).
https://www.ukconstructionmedia.co.uk/press-releases/how-to-reduce-noise-pollution-in-homes/

At a scientific level, sound and noise are technically the same - they are vibrations in the air (or in water) that we pick up with our ears. The bigger the waves are (their amplitude), the stronger the vibrations are, and the louder the sound is. However, sound is something that we hear in general. The visual presentation of the scale of noise pollution will make it easier to remember the data. Getting to know the positive and negative effects of pollution will contribute to a clear distinction between what is useful and what is not:
Sound vs. noise | let's talk science. (n.d.).
https://letstalkscience.ca/educational-resources/stem-explained/sound-vs-noise

The article „Why We Need to Reduce Noise Levels in Cities“ offers useful information for the teacher and the opportunity not only to explain to students/children the concept of “noise pollution” and to tell them how noise pollution affects our health, but also to encourage them to think about finding creative solutions:
Matthews, K. (n.d.). Why we need to reduce noise levels in cities. Planetizen Blogs.
https://www.planetizen.com/blogs/96881-why-we-need-reduce-noise-levels-cities

What are the Differences Between Sound and Noise? Find infos here:
Hatko Sound Barrier. (2021, January 28). What are the differences between sound and noise?
https://www.hatkosoundbarrier.com/what-are-the-differences-between-sound-and-noise/

Find infos about nocturnal pollinators here:
These 6 nocturnal pollinators work the night shift to better the planet. Brightly. (n.d.).
https://brightly.eco/blog/nocturnal-pollinators

Find a collection of DIY-ideas to attract pollinators to yards and parks:
Bramen, L. (2020, February 28). DIY: Creating a Pollinator Paradise. The Nature Conservancy.
https://www.nature.org/en-us/magazine/magazine-articles/pollinator-paradise/

Information about flowers that attract pollinators:
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VISIONARY BOX

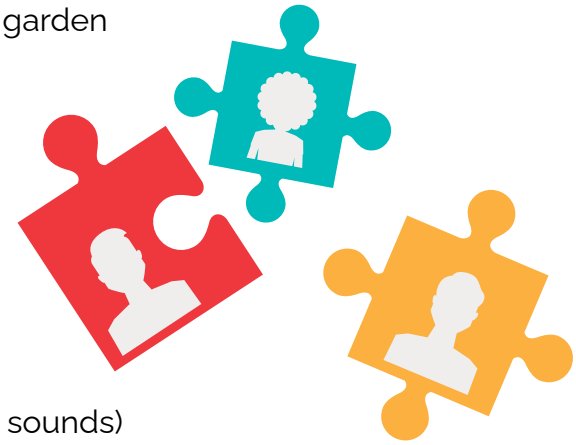
North Macedonia

Every year, the Municipality of Karposh in Skopje, organises a competition for the best decorated Eco-Schoolyard in the Municipality of Karposh and raises the awareness of students, parents and teachers about the importance of the environment. This motivates students, teachers and parents, and everyone works together as a team on the project. The cash prize is an additional incentive to participate. Prize money is used to purchase additional materials and improve the yard. Throughout the year, the students take care of the yard and the seedlings that have been planted, but they also spend more time in nature, as lessons are held in the outdoor classroom.

CONNECTED ACTIVITIES

Delicious Food: Growing Food in the City

Place for planting "Eco garden" in school
Making pots from recycled materials
Eco center (rainwater, waste selection, composting)
Making barrels to collect rainwater
Starting compost
Recycled paper cards with seeds
Using the fruits, vegetables and herbs from the school garden



Pollination Paradise

Polination jelly experiment
Bee feeder
Making a tree from fallen branches with flowers

Sound vs. Noise

Urban bird observing adventures (make a e - book with sounds)
Create an outdoor music station from recyclables!
A mobile sculpture made of sound-producing wires
Making graphics from cardboard stamps (bird, butterfly)
Build a bird nest
Making a hummingbird and a flower with combined technique

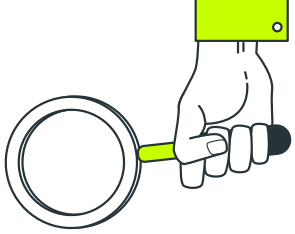
Wicked Weed

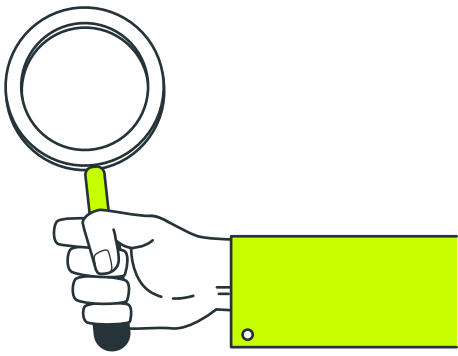
Will follow later

Interacting with Nature

Earth Day Hunt (nature treasure hunt, scavenger hunt)
Home fire extinguisher
A global warming sandwich
Make a game out of recycled material
Natural flower sun-catchers
How to behave when there are thunderstorms and storms with crossword puzzle
Leaf hunt

SOURCES





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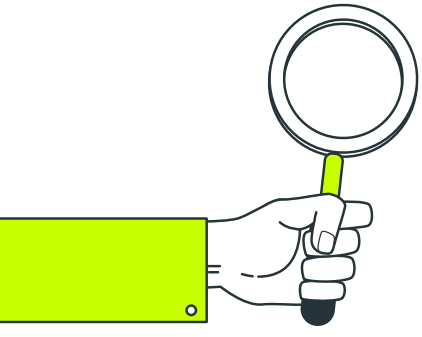

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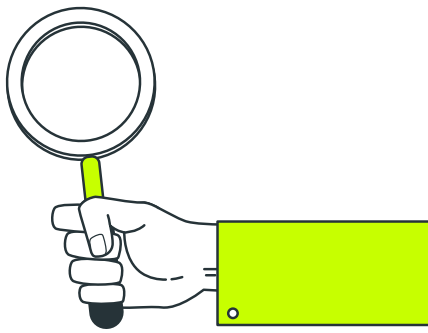

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