CURRICULUM

Through Upcycling to the Design of Eco Cities

CITIES FOR THE FUTURE

Co-funded by the European Union

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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

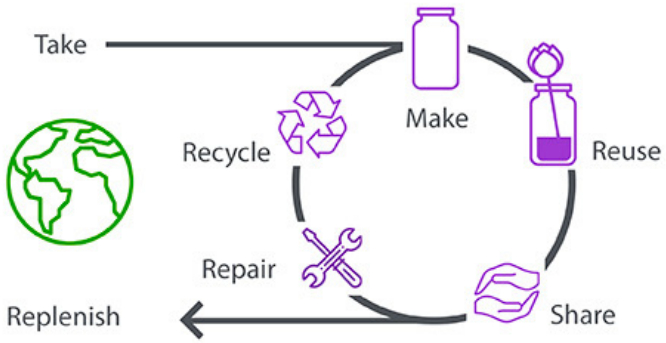
➔ Recycle

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

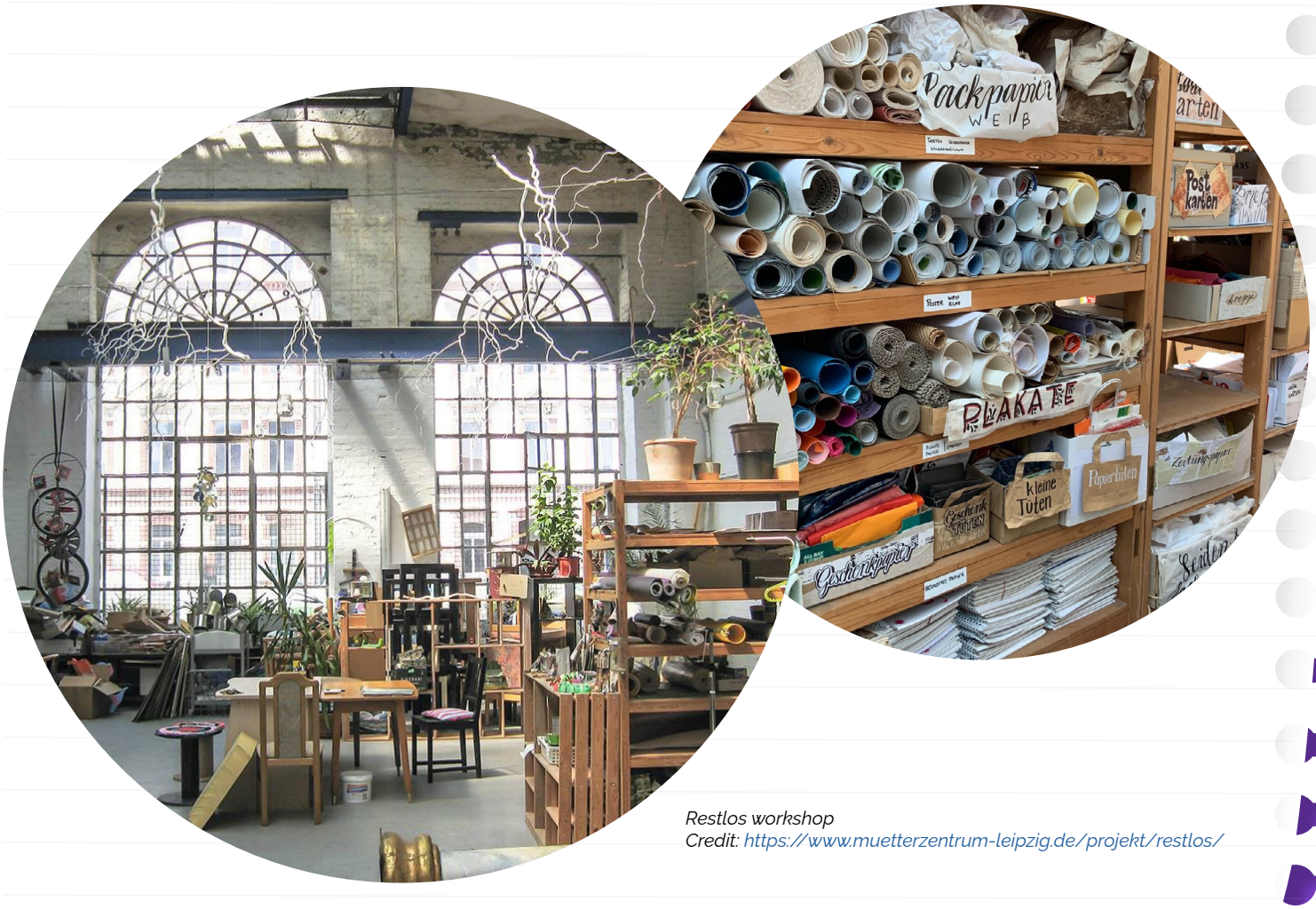
Restlos – Workshop Space for Environmental Education and Upcycling

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

2.1 Overripe is Super Tasty

2.2 Wax Food Wraps

2.3 Making Paper from Paper Scraps

2.4 Botanical Dyeing

2.5 Furoshiki

2.6 Denim Feather Decoration

2.7 Rain Boot Garden

2.8 Playground from Reuse Material

2.9 Inclusive Playground from Reuse Material

2.10 Intercultural Playground from Reuse Material

2.11 Learners' Space from Reuse Material

2.12 Recycling Station

2.13 Recycling Station for Groups with Learners with Impaired Mobility

2.14 Recycling Station for Groups with Learners with Visual Impairment

2.15 Multi-Lingual Recycling Station

2.16 Collection Spot for Hazardous Waste

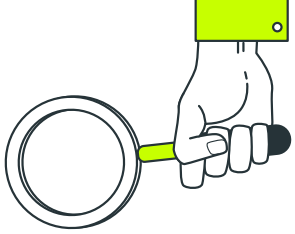
2.17 Audit your Trash

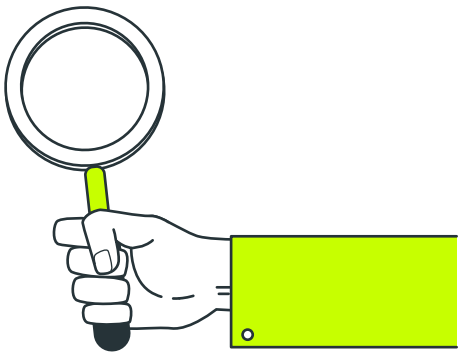
2.18 Display your Trash

2.19 Repair Café

2.20 Repair Café Visit

SOURCES





MODULE 1: Sharing the City

Arup (2017). Cities Alive. Designing for urban childhoods. https://www.arup.com/perspectives/publications/research/section/cities-alive-designing-for-urban-childhoods

Bollier, D. (2011, July 15). The commons, short and sweet. https://www.bollier.org/commons-short-and-sweet

Clark, L., & Rockefeller, R. (2020). The buy nothing, get everything plan: Discover the joy of spending less, sharing more, and living generously. Atria Books.

Luscher, D. (13 July, 2021). Access, not mobility. https://www.15minutecity.com/blog/access

Montgomery, C. (2015). Happy city: Transforming our lives through urban design. Penguin Books.

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

Paris en commun (2020). La ville du quart d'heure en images. https://www.paris.fr/pages/la-ville-du-quart-d-heure-en-images-15849

Roberts, David (May 26, 2019). Barcelona's radical plan to take back streets from cars. Introducing "superblocks". Vox. https://www.vox.com/energy-and-environment/2019/4/9/18300797/barcelona-spain-superblocks-urban-plan

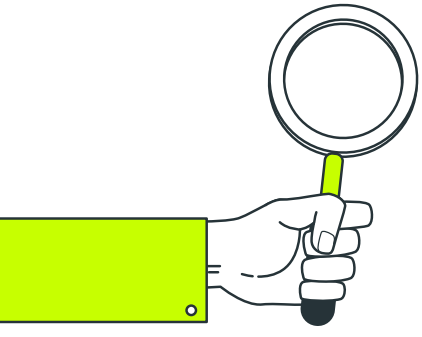
Shareable (Ed.). (2018). Sharing cities. Activating the Urban Commons. Tides Center / Shareable. Free PDF download on: https://www.shareable.net/sharing-cities/downloads/

Smart Prosperity Institute. (n.d.). The cost of Sprawl. Smart Prosperity Institute. https://institute.smartprosperity.ca/content/cost-sprawl

Tessa, C. (2023, February 28). The surprising climate benefits of Sharing your stuff | tessa clarke | ted. YouTube. https://www.youtube.com/watch?v=6DRMrFMNXCc

Crowd Expedition. (2015, September 25). Local sharing and connecting through physical hubs: Dedeelkelder. YouTube. https://www.youtube.com/watch?v=0C69-sHjbTM

Vulk Coop. (2020, May 6). Governing the commons in six minutes. YouTube. https://www.youtube.com/watch?v=B4hVbLjP1v8



Chang, A. (2017, September 5). The life cycle of a T-shirt. YouTube.
https://www.youtube.com/watch?v=BiSYoeqb_VY

EU Science Hub. (n.d.). Definition of recycling.
https://joint-research-centre.ec.europa.eu/scientific-activities-z/less-waste-more-value/definition-recycling_en

Kaza, Silpa; Yao, Lisa C.; Bhada-Tata, Perinaz; Van Woerden, Frank. (2018). What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. Urban Development. World Bank.
http://hdl.handle.net/10986/30317

LE Europe, VVA Europe, Ipsos, ConPolicy & Trinomics. (2018, October). Behavioural study on consumers' engagement in the circular economy. Publications Office of the EU.
https://op.europa.eu/en/publication-detail/-/publication/0779f275-f9d6-11e8-a96d-01aa75ed71a1/language-en

Norman Ebner, Eleni Iacovidou, (2021). The challenges of Covid-19 pandemic on improving plastic waste recycling rates. Sustainable Production and Consumption, Vo. 28, 2021.
https://www.sciencedirect.com/science/article/pii/S2352550921002001

Overstreet, K. (2020, July 17). Giving demolished building materials a new life through recycling. ArchDaily.
https://www.archdaily.com/943293/giving-demolished-building-materials-a-new-life-through-recycling

Playground Ideas. (2023). http://www.playgroundideas.org/

SDG 11 - sustainable cities and communities statistics explained. (n.d.).
https://ec.europa.eu/eurostat/statistics-explained/SEPDF/cache/63347.pdf

The Story of Stuff. (2022, December 21). Imagining an economy where you don't have to buy anything | solving plastic. YouTube. https://www.youtube.com/watch?v=kOskoCh8KXU

Repaircafe. (2023, May 23). Repair café - fix your broken items. https://www.repaircafe.org/en/

Ro, C. (2022, February 24). Can fashion ever be sustainable?. BBC Future.
https://www.bbc.com/future/article/20200310-sustainable-fashion-how-to-buy-clothes-good-for-the-climate

UN Habitat. (2021). Waste wise cities tool. https://unhabitat.org/sites/default/files/2021/02/Waste%20wise%20cities%20tool%20-%20EN%203.pdf

UNIDO. (n.d.). Circular economy.
https://www.unido.org/our-focus-cross-cutting-services/circular-economy

United Nations. (n.d.). Goal 11 | Department of Economic and Social Affairs. United Nations.
https://sdgs.un.org/goals/goal11

Waste recycling in Europe. (2022, November 11).
https://www.eea.europa.eu/ims/waste-recycling-in-europe

MODULE 3: City for All

Amadò, M., & Massa, L. (n.d.). Bambini, design e appropriazione del quartiere Il caso dei percorsi pedonali casa-scuola Rapporto di uno studio. Laboratorio Cultura Visiva.

Blades, M. and Spencer, C. (1986) Map use in the environment and educating children to use maps, Journal of Environmental Education and Information 5.

Community building: Logiche E strumenti di management: Longo Francesco, Barsanti Sara: Libro: Egea. HP. (n.d.).
https://www.egeaeditore.it/ita/prodotti/economia/community-building-logiche-e-strumenti-di-management_.aspx

Dini, D., Longo, S., & Palladino, N (n.d.). Diventare città sostenibili: cosa può insegnare Tricase alla grande Milano. Il Sole 24 Ore.

Durkheim, E., & Baracani, N. (1979). Educazione come socializzazione: Antologia. La nuova Italia.

Franco, E. (2016, April 22). Placemaking, un modo diverso di pensare e vivere lo Spazio Pubblico. Giornale dell'Architettura.
https://ilgiornaledellarchitettura.com/2016/04/22/placemaking-un-modo-diverso-di-pensare-e-vivere-lo-spazio-pubblico/

Hart, R. (1979). Independent explorations: Children's experience of place. Irvington, New York, 1979 Science, 204 (4394).

Ikiz, S. U. (2023, July 26). Planning-by-doing: How can tactical urbanism help to create better urban spaces?. Parametric Architecture.
https://parametric-architecture.com/planning-by-doing-how-can-tactical-urbanism-help-to-create-better-urban-spaces/

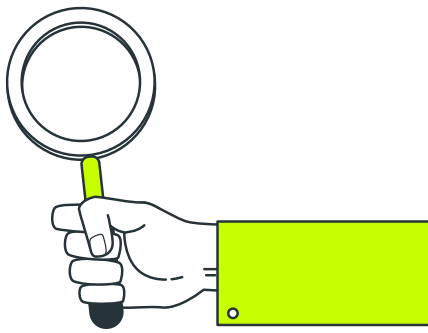
Let's reclaim our #streetsforkids! Italy. (2023, September 19).
https://italy.cleancitiescampaign.org/streetsforkids/

Park, R. E., Burgess, E. W., & McKenzie, R. D. (1968). The city. University of Chicago Press.

Pizzorno, A., Park, R. E., Burgess, E. W., Mckenzie, R. D., & De_Palma, A. (1967). La Città. Edizioni di Comunità.

Rissotto, A., & Tonucci, F. (2002). Freedom of movement and environmental knowledge in elementary school children. Journal of Environmental Psychology, 22 (1–2).

StreetfilmsVlog. (2010, December 15). Revisiting Donald Appleyard's Livable Streets. YouTube.
https://www.youtube.com/watch?v=ESgkcFbGiL8



Tonucci, F. (1999). La Città dei Bambini. Laterza.

Tonucci, F., & Natalini, P. (2019). A scuola ci andiamo da soli: L'autonomia di Movimento dei Bambini. Zeroseiup.

Vitale, A. (2007). Sociology of Community. Carocci.

Whyte, W. H. (2018). The social life of small urban spaces. Project for Public Spaces.

MODULE 4: Tree Friends

Go Smart Bricks. (2021, June 21). Urban heat island.
https://gosmartbricks.com/urban-heat-island/

Smart Cities Dive. (n.d.). Why We Need Trees in Our Cities.
https://www.smartcitiesdive.com/ex/sustainablecitiescollective/why-we-need-trees-our-cities/1100050/

World Economic Forum. (n.d.). Four reasons why cities need a healthy tree cover.
https://www.weforum.org/agenda/2022/06/cities-urban-trees-climate-change/

MODULE 5: Animal Neighbours

Buglife. (2022, October 20). Gardening for bugs.
https://www.buglife.org.uk/campaigns/no-insectinction/room-for-insects-to-thrive/insect-havens-in-towns-and-cities/

DwightCooper, & Smith, J. (2021, March 19). Insects in the city - encouraging wildlife into towns & cities. The Wise House.
https://www.thewisehouse.co.uk/blog/read_197740/insects-in-the-city-encouraging-wildlife-into-towns-cities.html

Goulson, D., & By. (2022, October 18). Insect decline: An ecological armaggedon: Heinrich Böll stiftung: Brussels Office - European Union. Heinrich-Böll-Stiftung.
https://eu.boell.org/en/PesticideAtlas-insect-decline

Guardian. (2019b, February 10). Plummeting insect numbers "threaten collapse of nature."
https://www.theguardian.com/environment/2019/feb/10/plummeting-insect-numbers-threaten-collapse-of-nature

MODULE 6: City for all Senses

National Wildlife Federation. (n.d.). Biodiversity.
https://www.nwf.org/Educational-Resources/Wildlife-Guide/Understanding-Conservation/Biodiversity

UNICEF Office of Global Insight & Policy. (2020, November 12). Why biodiverity is important for children. https://www.unicef.org/globalinsight/stories/why-biodiversity-important-children