

# Unit 13

Landscape & Climate Change  
Adaptation in Education

## How to Build a City? Urban Landscape

**INTRO:** How did a city appear in the landscape? When and why was it created, how has it changed and what is its importance for humans today? What should a city be like to offer a good quality of life?

AGE GROUP

6–11 years

DURATION

5 lessons  
(45 min each)

LINKS TO CURRICULUM

History

Biology

Geography

Mathematics

Language

Literature

Arts and Crafts

# Legend

## Layout orientation

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Page content

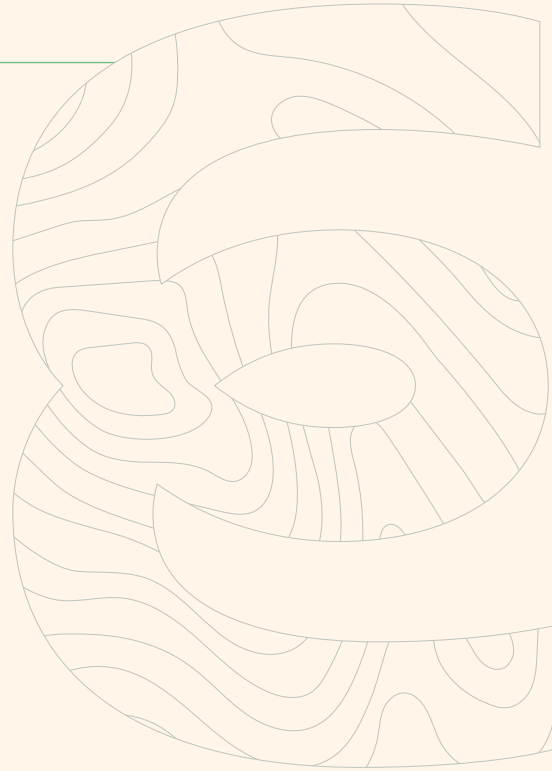
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## Content icon

for teachers

for students

references

## Phase of the Unit

gaining knowledge

analyzing

creating



# Structure

## Introduction

01

What is Landscape?

02

What does the Landscape Consist of?

03

European Landscape in a Changing Climate

## History, Culture & Heritage

04

Agriculture Transforms the Landscape

05

Landscape as a Chronicle

06

Landscape through My Eyes

## Landscape as a Resource

07

Tracing what We Eat

08

Landscape as a Source of Materials & Energy

09

Landscape is a Network

## Nature Designs

10

River Landscape

11

Plants as Partners in the Challenge of Climate Change

12

Where Landscape is Growing Wild

## Humans Design

13

How to Build a City? Urban Landscape

14

Proximity Landscapes

15

Into Action

# How to Build a City? Urban Landscape

**Landscape is present in the city, too, but it has gained a different form. Human settlements are an integral part of the landscape; the city plays an irreplaceable role in human culture.**

This unit is an introduction to the development and the importance of the urban landscape for both humans and nature. It aims to provide students with an understanding of the role the urban landscape has in the context of basic human needs, social relationships, and infrastructure, as well as the protection of biodiversity and respectful use of natural resources.

The unit invites the students to reflect on the definition of the urban landscape, presents the history of urbanization and offers insights into contemporary trends in urban planning and design. Emphasis is placed on practical activities: to stimulate their imagination and use learnt principles in real life, students create models of cities, use mapping to analyse city functions, design neighbourhoods, etc.

## AGE GROUP

**6–11 years****ENVIRONMENT**

*Classroom/School Garden/  
Landscape*

**TIME REQUIRED**

one project day  
(5 lessons, 45 min each)

**LINKS TO THE CURRICULUM**

*History, Biology, Geography,  
Mathematics, Language,  
Literature, Arts and Crafts*

**KEY WORDS**

*City, Blue–Green Infrastructure,  
Urban, Infrastructure, Urban Heat  
Island, Spatial Planning*

**GOALS**

- Students gain awareness that a city is a cultural construct – a human creation
- Students discover the purpose of a city and deduce its main functions (economic and protective)
- Students gain an understanding of the organic growth of cities
- Students develop their spatial imagination and planning skills

**INTENT – CONNECTION TO THE ISSUE OF CLIMATE CHANGE ADAPTATION AND REDUCTION OF ITS IMPACTS**

Cities are dynamic centres of human activity characterized by a high density of population, intensive economic activity, and large infrastructures. A major environmental challenge the cities face is the phenomenon of urban heat islands. This phenomenon occurs when urbanised areas record higher temperatures than surrounding rural areas. The main cause is the replacement of natural vegetation with nonpermeable surfaces, such as concrete, asphalt, and buildings which absorb and then release heat. Other factors contributing to urban heat islands are intensive human activities, transport and industrial emissions, and limited green surfaces. Urban heat islands may negatively impact the quality of life of city inhabitants, increase energy consumption (e.g. due to increased use of air conditioning), and contribute to reduced air quality.

Measures, such as increasing the share of green surfaces in cities, using light-coloured construction materials, and supporting sustainable transport may help mitigate this problem and contribute to a healthier urban environment. A systematic approach leads to the creation of blue—green—grey urban infrastructure.

# How to Build a City?

## Urban Landscape

### Activity 1

#### What makes a city a city?

In this activity, students reflect on what characterizes a city and what differentiates it from other types of settlement. A creative method is used – each student says what the word “city” associates for him/her –to create a collective picture of a city, which is then analysed and discussed. This activity enhances the understanding of the city as a cultural construct and of the importance the urban environment has in social interactions.

### Activity 3

#### Organically—grown cities

In this activity, students are divided into small groups and attempt to reconstruct the development of an urban structure using prisms and cubes as buildings. The aim is to experiment with the principles of an organically—grown city and discover the challenges cities face as a consequence of expansion and limited space. The activity encourages students to reflect on the advantages and disadvantages of the organic growth of a city.

### Activity 2

#### Creation of cities

Students learn about the history and development of cities: starting with nomadic societies, through the creation of agricultural settlements and later on cities. This activity includes reading text and creating live tableaux set in different periods of history as a means to learn how the economic and protective functions of cities contributed to their urbanization and formation. The activity strengthens historical awareness and provides the students with a better understanding of the changes human settlements underwent over time.

### Activity 4

#### Urban planning

Students get acquainted with modern trends in urban planning, especially with the concepts of a zone and a 15—minute city. They work with cards and a grid to try for themselves how a city can be designed, thus learning about the importance of accessible services and infrastructure for a better quality of life in the city.

**Activity 5****Mapping the surroundings**

Students are divided into groups to map functions of various areas/spaces in their surroundings and mark them on the map.

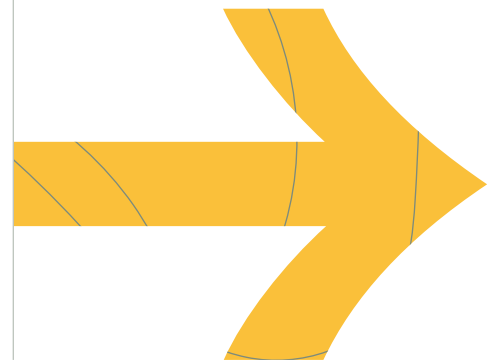
This activity strengthens the ability of observation and analytical thinking: students learn to differentiate between housing, transport, services, and leisure and reflect on the polyfunctionality of urban spaces.





# Introduction

## ABOUT THE TOPIC



## Creation of cities

The creation of cities is a key moment in the history of human civilisation. This process can be traced from the nomadic way of life through the transition to agriculture, to the formation of the first cities.

**Nomadic life (hunters and gatherers):** in the earliest periods of human history, people lived as nomadic hunters and gatherers. Their lifestyle was adapted to their need to search for food and resources. They either built simple shelters or used natural shelters, such as caves. People lived in small and mobile groups dependent on the availability of natural resources.

**Transition to agriculture (the Neolithic Revolution):** a moment of major importance in human history was the discovery of agriculture during the Neolithic period. As the human population grew and resources became scarcer, many clans settled in one place and started experimenting with animal domestication and crops. People adopted the lifestyle of farmers and animal herders. In permanent settlements, they started to build more permanent dwellings. Over time, agriculture proved more advantageous than hunting and gathering because it provided a more stable and predictable source of food, and the human population began to increase quickly.

**Creation of crafts and trade:** as food resources became more stable and the population grew, more people could dedicate themselves to other activities than agriculture. Various crafts were developed, such as the production of tools, processing of agricultural products and sewing of clothes. Farmers needed tools, while craftsmen needed food, which led to barter. People gathered in markets where they bartered their products; over time, these places had become the centres of economic activity.

**Creation of cities:** as trade and crafts developed, settlements became larger and more permanent: they became cities. Cities have become the centres of economic, political, cultural, and religious activity. They offered better possibilities of protection to the inhabitants and their possessions. This led to the construction of fortifications and other defensive structures. The creation of cities was a natural consequence of the need to centralize trade, protection and administration.

## Organically-Grown Cities

An organically-grown city is a settlement that originated and evolved gradually and naturally, often without an urban plan. This process often took centuries and the result is influenced by local geographical, economic, and social conditions. Unlike planned cities created according to a specific design and organized regular layout, organically—grown cities have an organic character with an irregular structure of streets, squares and other public spaces.

### The main characteristics of an organically-grown city

- 1. Irregular network of streets:** streets of organically—grown cities are characterized by their irregular shape. They are curvy and their routes would adapt to natural obstacles and existing structures. You can find this type of streets in historical parts of many European cities.
- 2. Historical variety:** due to their gradual development, organically—grown cities feature many construction styles from different historical periods. Older buildings stand next to more recent ones, thus creating a unique historical and architectural mosaic.
- 3. Natural centre:** in organically—grown cities, the centre often evolved around the original settlement or points of importance, such as castles, churches, markets or crossroads of trade routes. Often, a square formed in the central part and served as a meeting point and trade centre.
- 4. Functional diversity:** organically—grown cities are characterized by their functional diversity. Different parts of the city may have different functions (residential, commercial, industrial) that evolved in reaction to the changing needs of inhabitants.

**Examples of organically—grown cities:** many historical European cities, such as Prague, Vienna, and Venice are examples of organically—grown cities. These cities have an irregular network of narrow streets, historical buildings dating back to different periods, and naturally created centres.

## Urban planning

The following cities represent different historical approaches to urban planning and reflect specific needs and ideals people had at the time of their foundation.

**České Budějovice:** The city of České Budějovice was founded in 1265 by the Czech King Ottokar II as a royal city on the confluence of Vltava (Moldau) and Malše rivers. The city was carefully planned according to the ideals of medieval urbanism with a regular right-angle network of streets. The centre of the city is the square-shaped Ottokar II Square, one of the largest in the Czech Republic. The square is surrounded by historical houses with arcades and includes important public buildings, such as the city hall. České Budějovice is known for its well-preserved Gothic-, Renaissance-, and Baroque-style buildings.

**Nové Zámky:** the city, founded in 1573, is an example of Renaissance urban planning in Slovakia. The city was built as a fortress, featuring a chessboard layout, typical of the Renaissance period. The main axis of the city is its central square with a church and a city hall from where streets radiate outward. The city was built for military purposes, and therefore city walls and bastions, which ensured the protection of the city, were part of the urban plan. Nové Zámky is a combination of military functionality and aesthetic Renaissance elements.

**Terezín:** The city was founded in 1780 by Emperor Joseph II as a strategically located military fortress in North Bohemia. Terezín's urban planning is a typical example of 18th-century military architecture: it features a precise geometric layout and symmetric structure. The city has two parts: the Main Fortress and the Small Fortress, both surrounded by massive bastion walls. The central axis is formed by the main street leading to the central square. All streets are wide and regular to allow for fast movement of army units and equipment. Terezín has a unique, purpose-oriented and precise layout, which combines military, housing, and administrative functions.

### 20<sup>th</sup> and 21<sup>st</sup> centuries

The **zone city** is an urban design concept, which divides the city into various zones or areas according to their primary purpose or character. This approach to urbanism emphasizes a functional division of the city into sectors, such as residential areas, commercial and industrial zones,

leisure areas and green surfaces, and transportation infrastructure. The zone city concept was very popular in the first half of the 20th century and was part of modernist urban design theories, such as Le Corbusier's *Ville contemporaine*, a city for three million inhabitants. However, this theory was later on criticized for exaggerated separation of functions, which may lead to increased car dependency, lack of mixed-use spaces and a weaker feeling of community cohesion. Today, urban planners often strive to find a balance between zone planning and mixed-use of spaces, thus promoting the creation of livelier and better-integrated urban environments.

The **15-minute city** (15mC) is an urban planning concept that aims to create an urban environment where all basic needs of the inhabitants, such as work, education, shopping, healthcare, culture, and leisure activities, can be easily reached within a 15-minute walk or bike ride from home. This approach focuses on improving the quality of life of city dwellers by reducing car dependency, supporting sustainable urban mobility, and increasing accessibility of urban services and facilities. A 15-minute city supports the concept of a "city within a city" where each neighbourhood offers full functionality and enables its inhabitants to have a quality life without the necessity of long commutes. This leads to an increased diversity of land use, strengthens local communities and economies, and encourages a more sustainable environment. The concept gained increased popularity with the advent of the climate crisis and as a reaction to it: it offers a way of addressing challenges related to urbanisation and city growth. Other than improving the urban environment and reducing greenhouse gas emissions, the 15mC concept aims to increase social interactions and strengthen the feeling of community among inhabitants.

### Blue, green, and grey infrastructure

The blue, green, and grey infrastructure is a modern approach to urban planning that integrates three key components – blue, green, and grey infrastructure – to create a more sustainable and resilient urban environment.

The integration of these three components leads to an urban environment which is resilient to climate change, supports the health and well-being of the inhabitants, and contributes to sustainability. Examples of blue–

green—grey infrastructure include green roofs with retention reservoirs, urban parks with natural water features, porous surfaces in parking lots and streets, and integrated systems for the collection and recycling of rainwater. This approach enables the cities to better face the challenges related to urbanisation and climate change.

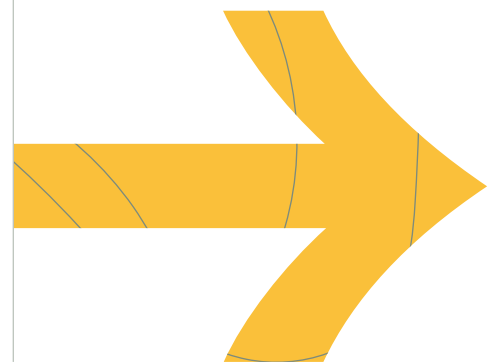
**Blue infrastructure:** water elements in an urban environment, such as rivers, streams, ponds, lakes and artificial water reservoirs. This component focuses on sustainable use of water resources, improved water quality, and prevention of floods. Examples of blue infrastructure include retention reservoirs, green roofs with retention elements, and systems for collecting and using rainwater.

**Green infrastructure** includes all elements of natural vegetation in cities, such as parks, gardens, green roofs, vertical gardens, urban forests, and tree avenues. This component promotes biodiversity, improves air quality, reduces heat, and provides recreational spaces to the city's inhabitants. Green infrastructure is a key element in fighting urban heat islands and improves the microclimate in urban environments.

**Grey infrastructure:** traditional construction elements and technical networks, such as roads, sidewalks, buildings, sewerage systems, and mains electricity. Grey infrastructure is the basis for the functioning of cities and their infrastructure. The blue, green and grey concept aims to integrate smart grey infrastructure solutions, such as rainwater retention reservoirs and solar panels, with blue and green elements to reach synergy effects and maximum sustainability.



# Activities for Students



## Activity 1

**TIME REQUIRED:**

20 minutes

**AIM:**

students gain awareness that city is a cultural construct – a human creation

- develop the understanding of a city concept as a cultural construct
- critical thinking and discussion on various aspects of urban life
- stimulate social interaction between students.

**TOOLS:**

A sufficient amount of paper cards and felt–tip pens/ markers for each pupil.

A large sheet of craft paper or a board on which students can write their ideas.

## What makes a city a city?

**Description:****Introduction**

Start with a short discussion about what the pupils think of when they hear the word “city”. Mention the fact that cities are more than physical structures; they are also a meeting point of various cultures, histories and social interactions.

**Main Part**

- Ask each student to write down on the card a word/sentence they think characterizes the city. It can be anything: specific items, such as buildings and parks, or more abstract notions, such as community and diversity.
- Then let each student come one by one and stick their card on the sheet of table/board. Together, they create a collective “map” of ideas.
- Let the class observe the associations. Ask students to share why they chose their word/sentence.
- Ask questions encouraging reflection and discussion, such as: “Which elements do you think are the most important ones for a city?” or “What words were mentioned the most often and why?”

**Conclusion**

Resume the main ideas mentioned in the discussion and underline the variety of perceptions on what makes a city a city. Mention how these perspectives reflect the complex character of cities and the importance of social, ecological, and economic aspects of urban life.



## Activity 2

**TIME REQUIRED:**

30 minutes

**AIM:**

students learn what the purpose of a city is and can deduce its main functions (economic and protective)

**TOOLS:**

Worksheet with text and props for creation of the live tableau (stick as a spear, basket, coins, etc)

## Creation of cities

**Description:****Introduction**

Divide the class into groups; each group gets a part of the text describing a different phase of the development of cities.

**Main Part**

- Groups read and discuss their texts and then prepare a live tableau or a short sketch that illustrates “their” phase of urban development.
- Groups get time to prepare and then each group presents their live tableau to the others.
- After each presentation, discuss what the scene depicts.
- Together, try to identify the main factors that led to the formation of the towns (e.g. agriculture, trade, church).

**Conclusion**

Infer the second important – protective – function with the students as you finish the story. Lecturer: “Granaries and craftsmen’s workshops attracted thieves of all kinds, and so the marketplace and surrounding warehouses and houses needed to be protected – perhaps by...” Students can suggest possibilities of protection/defence – the word “walls” certainly comes up at some point, allowing you to progress to the next activity. In ancient times, when there were no shops or houses, people lived very different lives.

**WORKSHEET**

They went from one place to another to find food. They hunted animals and gathered fruit and nuts. Because they moved around so much, it was not worth building houses, so they looked for simple places to sleep in, such as caves.

Later on, people discovered a great thing: agriculture. They learned how to grow plants and breed animals, which meant they no longer had to travel far or often to get enough food. They could stay in one place, build sturdier houses and cooperate more as time went on.



When it was no longer necessary for everyone to gather food, more people became craftsmen: some made tools, others made clothes. The first marketplaces emerged where people could exchange the things they made. Farmers offered their surplus from the harvest and craftsmen offered their products. The societies began to grow, the number of people and houses increased, towns grew larger and richer...

Prepare suitable props to represent hunters, farmers, craftsmen and traders.

## Activity 3

**TIME REQUIRED:**

30–45 minutes

**AIM:**

Pupils gain an understanding of the principle of organically—grown cities and develop their spatial imagination and planning skills.

**TOOLS:**

Sheets of paper for each group and various prisms and boxes will be used as buildings. (Please note: based on the material available, it is necessary to try the activity beforehand to correctly deduce the size of the city walls — it is necessary to “rehearse” that over time, it becomes complicated to place more “buildings” inside the city walls due to lack of space).

Paper tape for joining the models.

## Organically—grown cities

**Description:****Introduction**

Explain the concept of an organically—grown city and discuss how cities grew organically in reaction to the various needs of its inhabitants.

**Main Part**

- Students work in small groups of 3–4. Each group gets a drawing of city walls. The task is to create a model of an early—medieval city.
- Groups place buildings (boxes) on their sheet to create a functional city with a square, houses, church, granary, workshops, etc.
- It is important to explain that one box is one building. Each box placed onto the sheet is numbered and may not be moved any further.
- Suggested sequence of buildings:  
6 houses — granary — 3 houses — church — storehouse — 4 houses — 2 workshops — additions to the 2 oldest houses — second granary — 2 houses — 1 workshop — storehouse — 2 houses...
- Additions and extensions are glued with paper tape.
- The construction of the town ends when all boxes are used.

**Conclusion**

Each group presents its city and describes the experience of building an organically—grown city; what problems they encountered and how they solved them.

Discuss the advantages and disadvantages of organic urban growth.

**Teacher's note**

If you paint the boxes white in advance, children can then paint and decorate them.

**Teacher's note**

If you want to incorporate movement into the activity, you can do its running version first, with individual pupils from groups taking turns running to their city placed at a distance. This means each child will place the buildings on his own. When one child returns, the next one will run with his building sequence etc... At the end, you look together at the cities built.



## Activity 4

**TIME REQUIRED:**

20 minutes

**AIM:**

Students get an understanding of the zone city and 15–minute city concept and how they influence the quality of life in an urbanized environment.

**TOOLS:**

Prepare blank grids and sets of cards with different city functions (see card game attached)

- houses=housing
- office buildings and factories=employment
- parks=relaxation
- public transport stop=movement
- schools, town halls, hospitals=services

(colours: red, blue, green, purple, yellow)

## Urban planning

**Description:****Introduction**

Explain to students the principles of a zone and a 15–minute city, including their advantages and disadvantages. Introduce the zone city as a model that divides the city into specific functions and the 15–minute city as a concept where all basic needs are reachable within a 15–minute walk or bike ride.

Divide pupils into small groups and distribute empty grids and sets of cards

**Main Part**

First, groups create a model of a zone city by placing cards on a grid; each function has its own specific zone.

Students then rearrange the cards to create a 15–minute city where the different functions are arranged so that they are within easy reach and connected.

**Conclusion**

Each group presents its model of a zone city and a 15–minute city, explains its decisions, and discusses the supposed advantages and disadvantages of each approach.

Follows a discussion on how different models of urban design may affect people's daily lives, mobility, social interactions and environmental impacts.



**text**

**text**

**text**

**text**



## Activity 5

**TIME REQUIRED:**

120 minutes

**AIM:**

Students observe and map functions of different spaces in their surroundings and understand the meaning of mixed use of space in an urban environment.

**TOOLS:**

Prepare black and white maps of the school surroundings or a part of the city for each group/student

Provide colour markers or crayons to mark different functions on the map.

## Mapping the surroundings

**Description:****Introduction**

Explain the task of exploring the urban space and point out the safety concerns. Introduce the categories students will mark on the maps (housing, transport, shops, services, leisure... you can refer to the colours used in the previous activity).

**Main Part**

Plan a walk together through the neighbourhood, get to know the area, stop at selected places, discuss the spaces and houses you see around you, and identify their functions. If the students know how to use a map, they can each colour their map individually.

**Conclusion**

- Discuss how different functions complement each other and how this affects life in the city.
- You can encourage students to re—imagine the route walked through the city and to think about the places where they might spend time with friends. Everyone then draws a circle to encompass all the places they have passed through during their journey. Students will then try to think of places where they could play with their friends and make a note of them. In the circle, they mark “places where they can play” using the form of a pie chart.
- Next, it is possible to narrow things down and talk about “potentially dangerous places”.
- Make a line of the pie charts and compare them.
- The teacher or the students can comment on the graph (less x more / expressed as a percentage)
- Together, go back to "places where they can play".
- Which ones are they? Are these places where they want to play? Places where they want to play but cannot? What prevents them from doing so? In which places they don't want to play? Why? Are there enough places where they can play? How would they modify the places where they cannot play so that they can play there?
- Children can draw these suggestions.

## Resources

### **A City for Everyone**

Okamura, O., Město pro každého. Manuál urbanisty začátečníka / A City for everyone. A Beginner's Guide to Urban Design. Praha: Raketa, 2020. ISBN 978–80–86803–67–8.

*The book introduces the principles of city planning. It highlights many of the problems cities face today, presents them in context and interrelationships, and pushes the reader to think about solutions. It is well suited as a comprehensive insight for adult readers, too.*

*The graphic design of the book is remarkable. A city model made of photographs was created by artists David Böhm and Jiří Franta.*

### **Cities for People**

Gehl, J. Města pro lidi / Cities for People. Brno: Partnerství, o.p.s., 2010. ISBN 978–80–260–2080–6.

*The book by architect and urban designer Jan Gehl is a seminal work in the field of urban planning; it focuses on the design of urban spaces from the perspective of human needs and activities. Gehl criticizes the modernist approach to urban design, which often neglects the everyday life and needs of its inhabitants. The author promotes the creation of pedestrian– and cyclist–friendly cities, with an emphasis on public spaces, social interaction and quality of life in cities. The book offers practical advice and inspiration for designing urban spaces that promote health, well–being and community life, making it an indispensable resource for architects, urban planners and policymakers seeking sustainable and human–centred development of cities.*

### **Genius loci**

Norberg–Schulz, Ch., Genius loci. Praha: Dokořán, 2010. ISBN 978–80–7363–303–5.

*The book by philosopher Christian Norberg–Schulz is a key work in the field of architecture and urbanism that deals with the concept of the "spirit of place" (genius loci). Norberg–Schulz explores how the physical and atmospheric characteristics of the environment influence human perception and interaction with space. The author shows how architecture and urban design can capture and express the unique character of a place, thereby contributing to the creation of meaningful and authentic*



*environments. The book is relevant not only to professionals in the field of architecture but also to the general public interested in the relationship between humans and the environment.*

### **A Pleasant and Resilient City**

MACEKOVÁ, Magdalena, Příjemné a odolné město. Možnosti snižování tepelného ostrova města pomocí přírodě blízkých řešení / A pleasant and resilient city. Possibilities of reducing urban heat islands with nature—friendly solutions. Brno: Partnerství, o.p.s. 2022.

*This easy—to—read and clear book provides comprehensive information on the issue of creating urban environments that are not only aesthetically pleasing but also resilient to environmental and social challenges. The author emphasizes the integration of green and blue elements, community participation and the adaptability of cities to climate change.*

### **Pěšky městem / Walking the City**

<https://peskymestem.cz/>

*It issues invitations to calls for schools and competitions for individuals. Sign up for one or organise your own local one.*

*A project supporting sustainable transportation.*

### **Brno zblízka / Volání Brna / Brno Close Up / Brno Calling**

<https://skoly.damenavas.cz/publikace/>

*Workbooks for young and older pupils, offering many activities and involvement in the community life of the city. Both publications aim to motivate small changes that can improve the public space and local relationships and connections.*

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