



ECOWEEK 2020 ONLINE CHALLENGE : W6 Gardens that Heal, Recycle and Upcycle

Leaders: Dr. Elias Messinas, architect and Despoina Kouinoglou, landscape architect Consultant: Iris Givoli-Faiman, architect

BRIEF

The workshop is based on four ECOWEEK workshop projects placed in various locations across the world: 'Therapy Garden for Immigrant Women' in Copenhagen, Denmark; 'Healing gardens' in Victor Babes Hospital Bucharest, Romania; the 'Sun Grove' Jerusalem, Israel; and two school courtyards in Agios Nikolaos, Crete, Greece. Within the framework of circular economy thinking and planning, the group will expand the life-cycle of previous projects in order to learn about circular design strategies, ways to create open spaces that heal and educate, using appropriate plants, landscaping, and using materials based on recycled content.

GOALS

The goal of the project is to incorporate the basic global principles of circular economy at a more local level and to rethink how projects with already *green* infrastructures could become even more circular. In order to achieve this main purpose, it is recommended to identify the legislation and to develop a strategic design and management plan, expressed in diagrams, sketches, drawings, images, text, etc. The project will develop strategies for design, maintenance, recycling and upcycling, and increase biodiversity in the future and we will focus on two main areas: (a) Materials, (b) Landscape Design and Planting (healing effects, properties of the plants, seasonality, colouring, texture, mixture and diversity of the plants). The projects were chosen based on their different locations and contexts. Long term we would like to think how the circular economy model can work in various locations and within different contexts, concepts (health and educational activities) and within existing landscape proposals. By the end of the workshop, we will evaluate the proposals of each group, and how the projects may achieve circular economy results.

BACKGROUND MATERIALS

SUB-GROUP 1: Healing Garden, Copenhagen:

- GOOGLE DRIVE FOLDER:

<https://drive.google.com/drive/folders/1wPFyFi7OidTPGHV0U69N827xwuBEYSmq?usp=sharing>

SUB-GROUP 2: Healing Garden, Bucharest:

- GOOGLE DRIVE FOLDER:

<https://drive.google.com/drive/folders/1TUu5G25N9MIAUi8tVQrscMk5rmpv0o4o?usp=sharing>



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SUB-GROUP 3: Sun Grove, Jerusalem:

- GOOGLE DRIVE FOLDER:

https://drive.google.com/drive/folders/1x_wdsliDp4BT6MEvWoKsKEgUW3J1baFL?usp=sharing

- Video on the project: <https://youtu.be/re0EO39QDws>

SUB-GROUP 4: School Yard (1), Ag. Nikolaos, Crete:

- GOOGLE DRIVE FOLDER:

<https://drive.google.com/drive/folders/1q0juN6JZpjuotz7yG6yUY5MrruTQHNG7?usp=sharing>

SUB-GROUP 5: School Yard (2), Ag. Nikolaos, Crete:

- GOOGLE DRIVE FOLDER:

<https://drive.google.com/drive/folders/1q0juN6JZpjuotz7yG6yUY5MrruTQHNG7?usp=sharing>

- Video on the project: <https://youtu.be/8N045P-2Yqo>

BASIC INFORMATION (to help you develop your own data)

LOCATION

Each project is located in a different geographic area. The map shows the exact locations. They can also be located in Google Maps per coordinates:

- **Therapy Garden for Immigrant Women** in Copenhagen, Denmark: Biespbjery Bakke
<https://www.google.com/maps/d/u/1/edit?mid=1Sm-5xHEXlpQGI4ylcOIUsMNq6P2HF0ew&ll=55.710565566858705%2C12.539927458370585&z=20>
- **Victor Babes Hospital** Bucharest, Romania: (44.421824, 26.122370)
<https://goo.gl/maps/yVfojWioRq4Td6jA6>
- **Sun Grove** Jerusalem, Israel: (31.767517, 35.217907)
<https://goo.gl/maps/BhVUNGRvD1o6jACR7>
- **School yard (1): 3rd Primary School** of Agios Nikolaos, Crete, Greece:
<https://www.google.com/maps/d/u/1/edit?mid=1Sm-5xHEXlpQGI4ylcOIUsMNq6P2HF0ew&ll=35.19080019195552%2C25.708364023838385&z=20>
- **School yard (2): 5th Primary School** of Agios Nikolaos, Crete, Greece:
<https://www.google.com/maps/d/u/1/edit?mid=1Sm-5xHEXlpQGI4ylcOIUsMNq6P2HF0ew&ll=35.18829130090678%2C25.70696281174355&z=20>



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CLIMATIC DATA

- General information on climate:
<https://www.climatedata.eu/climate.php?loc=grxx0013&lang=en>
- **DENMARK:** Copenhagen Climatic data:
<https://www.weather-atlas.com/en/denmark/copenhagen-climate>
- **ROMANIA:** Bucharest Climatic data:
<https://www.weather-atlas.com/en/romania/bucharest-climate>
- **ISRAEL:** Jerusalem Climatic data:
<https://www.weather-atlas.com/en/israel/jerusalem-climate>
<https://www.climatestotravel.com/climate/israel>
- **GREECE:** Agios Nikolaos, Crete Climatic data:
http://www.hnms.gr/emy/en/climatology/climatology_city?perifereia=Attiki&poli=Athens_Hellinikon
<https://www.weather-atlas.com/en/greece/agios-nikolaos-climate>
<http://climatlas.hnms.gr/sdi/>

MATERIALS

Where to find recycled construction materials and/or eco-friendly materials (examples):

- Materials (Denmark):
 - <http://www.ecolabelindex.com/ecolabels/?st=country,dk#W>
 - <https://www.weforum.org/agenda/2018/03/copenhagen-denmark-rebuilding-recycled-rubble/>
- Materials (Romania): <https://www.mdpi.com/2071-1050/11/11/3179/pdf>
- Materials (Israel):
 - http://www.sviva.gov.il/English/env_topics/Solid_Waste/Pages/ConstructionWaste.aspx
 - Materials Library: <http://www.dmh.org.il/pages/default.aspx?PageId=872&Preview=1>
- Materials (Greece):
 - http://uest.ntua.gr/iwwatv/proceedings/pdf/Mavridou-Kaisidou-Kazdaglis_Alaveras.pdf
 - <https://researchportal.bath.ac.uk/en/publications/construction-demolition-and-excavation-waste-management-in-eugree>
 - http://library.tee.gr/digital/del/del_m808.pdf
 - http://www.ecorec.gr/ecorec/index.php?option=com_content&view=category&layout=blog&id=57&Itemid=530&lang=en



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- Materials (General): <http://www.jcdiehl.nl/d4s-sbs/MH.pdf>

PLANTS

Seed banks in Copenhagen:

1. Copenhagen Seeds: <http://www.copenhagenseeds.dk/en/home/>

Seed Banks in Romania:

1. Casa Semintelor: <https://www.casa-semintelor.ro/en/>

Seed Banks in Greece:

1. Peliti: <https://peliti.gr/>

Seed Banks in Jerusalem:

1. Nativity seeds: <https://www.nativityseeds.com/en/about/>

The role of the Plants in Landscape Architecture (please use those as a guide):

1. Organise the space: by creating main or secondary areas
2. Achieve balance and harmony: There should be quality in the composition of the plants so a balance and harmony will be achieved by combining the masses, colours, textures, lines of the plants between the same and different plants.
3. Domination - emphasis - succession
Domination: The big size trees have a dominant role within a small garden.
Emphasis: Important features of the landscape can be emphasized by using plants with similar or same colour / shape.
Succession is being achieved by the way the composition of the plants is being developed and is being changed in front of the observer. The successive change in the size of the plants creates a rhythm.
4. Repetition - Rhythm: The repositioning of the plants with similar colour or size or shape or texture helps the user to understand the overall design. The repetition of horizontales masses enables the creation of the rhythm.
5. Diversity: different plants can make the space interesting and can increase the biodiversity. There should be a balance among the textures and the colours. Diversity can be achieved by following and repeating the diversity of the plants in the surrounding landscape.
6. Connectivity - Unification: The plants connect the space not only visually but functionally too. The tree trunks facilitate the connection between interior and exterior space. The groundcover and the short plants can visually connect and unify the entire composition.



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7. Separation-Delimitation: the separation of the space can be achieved by the use of the plants. The different size plants can delimit the space.
8. Isolation - Enclosure: tall shrubs can create vertical enclosure. The plants can hide and isolate visually unwanted objects.
9. Enhancement - Direction: The plants can screen and enhance a special feature and based on their shape and their location on the space can direct the user in a specific space.
10. Seasonality: they should create an interesting result during the whole year.
11. **The plant palette can include: Indigenous species, native and ornamental, herbs with therapeutic properties, vegetable, wildflowers**

Indicative Dimensions of the Plants:

Type of Plant	Height (m)	Width (m)
Groundcover	Up to 0.5	0.2-0.8
Small Size Shrubs (<1m)	0.5-1	0.5-1
Medium Size Shrubs (1-3m)	1-2	1-1.5
Big Size Shrubs (>3m)	2-5	1.5-2
Small Size Trees (3-7m)	5-7	3
Medium Size Trees (6-10m)	8-12	4-7
Big Size Trees (8-15m)	>10	7-10

HERBS with therapeutic and healing properties:

Analgesics: Valeriana officinalis, Passiflora incarnata, Scutellaria baicalensis
Piscidia erythrina, Matricaria chamomilla, Mentha piperita, Papaver phoeas, Pimpinella anisum, Rosa canina



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Anthelmintic: Allium sativum, Aloe vera, Thuja occidentalis, Tanacetum parthenium

Antiemetics: Cynara scolymus, Capsicum frutescens, Filipendula ulmaria, Anethum graveolens, Lavandula officinalis, Foeniculum vulgare, Mentha piperita

Anti-catarrhal: Althaea officinalis, Uva Ursi arctostaphylos, Achillea millefolium, Baptisia tinctoria, Verbascum, Euphrasia, Echinacea angustifolia Sambucus nigra, Allium graveolens, Solidago, Hydrastis canadensis, Hyssopus, Salvia

Anti-stone: Common couch, Agathosma, Uvaursi arcostafylus

Antimicrobials: Uvaursi arcostafylus, Artemisia absinthium, Baptisia, Eugenia caryophyllus, Gentiana lutea, Pimpinella anisum, Rosmarinus, Olea europaea, Eucalyptus, Thymus, Inula helenium, Calendula, Capsicum, Coriandrum, Mentha piperita, Comiphora, Plantago, Oreganum, Echinacea angustifolia, Allium sativum, Salvia

Indicative Sources of Indigenous Species:

1. **Copenhagen, Denmark:**

https://en.wikipedia.org/wiki/List_of_trees_of_Denmark
<https://www.gardenguides.com/112246-denmarks-native-plants.html>

2. **Bucharest, Romania:**

https://www.fauna-flora.org/countries/romania?gclid=CjwKCAjwqdn1BRBREiwAEbZcR0mmqTl4zBolvjVcjBxy1w8BCFByyYtWA0aAhsBsys89LNz-lbyY_RoC5uIQAvD_BwE
https://en.wikipedia.org/wiki/Flora_of_Romania
http://agrolifejournal.usamv.ro/pdf/vol.VII_2/Art5.pdf

3. **Agios Nikolaos, Greece:**

<https://www.sfakia-crete.com/sfakia-crete/herbs-plants-flora-crete.html>
<http://www.cretanflora.com/>
<https://www.incrediblecrete.gr/cretan-flora/>
<http://www.intocrete.net/features/wildflowers.asp>

4. **Jerusalem, Israel:**

https://en.wikipedia.org/wiki/List_of_endemic_flora_of_Israel
https://en.wikipedia.org/wiki/List_of_adventive_wild_plants_in_Israel
<https://www.botanic.co.il/en/knowledge-categories/israeli-wild-plants/>



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<https://mfa.gov.il/MFA/IsraelExperience/AboutIsrael/Spotlight/Pages/Flora%20and%20Fauna%20in%20Israel.aspx>

<http://www.wildflowers.co.il/english/about.asp>

ABOUT HEALING GARDENS

Many researches have shown that nature among others can reduce the stress, the anxiety, the depression and traumas and can be used in the therapeutic and healing processes. The therapeutic effects of nature to improve patients' recovery has been, for the first time, precisely written and published by Florence Nightingale in Notes on Nursing in 1860 (Jiang, 2013).

Several schools with different bodies of knowledge emerged, establishing a relationship between landscape and health to explore the healing mechanisms of nature (e.g medical geography, environmental psychology, ecological psychology and others) and gave a specific terminology based on different theories. However, many people still confuse the different terms of therapeutic landscapes and healing gardens.

The term "healing garden" has been widely recognized, referring to green outdoor spaces in healthcare facilities that provide a chance of stress relief for patients, staff and families.

Horticultural therapy scientists usually refer to "healing gardens" or "therapeutic gardens" as settings that provide places for gardening activities and encourage physical movements, such as therapeutic walking (Jiang, 2013 at Detweiler et al., 2012).

Therapeutic landscapes or gardens are designed to meet the particular needs of a specific patient population. They often engage that population actively and deliberately. Healing gardens, on the other hand, generally aim for a more passive involvement and are designed to provide benefits to a diverse population with different needs (M.J. Kreitzer).

Gardens provide psychological, social, physical, emotional, and spiritual benefits to humans. The most important feature in a healing garden is real nature-green vegetation, flowers, and perhaps a calm water element. Abstract art and sculpture should be avoided, as ill people often interpret in negative ways.

Most of the healing gardens are located adjacent to healthcare facilities. However, healing gardens are usually accessible by a larger group than the patients themselves. At a larger scale, some believe that



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any garden can be a healing garden and that the general population can find restorative benefits from such spaces, regardless of physical health needs. Taken at this scale, green spaces with restorative effects should be easily accessible by the surrounding population.

The Healing gardens are effective if they foster the following elements:

1. Sense of control
2. Social support
3. Physical movement and exercise
4. Access to nature and other positive distractions

The healing garden is about perception as well as activity. However, it is crucial to find the balance between just being in the garden experiencing it and working with gardening. To do that the designer needs to have knowledge about the group of people the garden is intended for, and be aware of their levels of mental power. A healing garden must be able to communicate with the visitor in a supportive and positive way. Depending on the visitor’s stress level, the garden should consist of different rooms with different characters; Serene, Wild, Rich in Species, Space, The Common, The Pleasure Garden, Festive, and Culture. Finally, a healing garden, like all public parks and gardens, should strive to be accessible to everybody and focus on the visitors’ needs.

The Eight Garden Room Characters	Character of the Room
Serene	Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no disturbing people.
Wild	Fascination with wild nature. Plants seem self-sown. Lichen- and moss-grown rocks, old paths.
Rich in Species	A room offering a variety of species of animals and plants.
Space	A room offering a restful feeling.
The Common	A green , open space admitting of vistas and stay.



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The Pleasure Garden	An enclosed, safe and secluded place, where you can relax and be yourself and also experiment and play.
Festive	A meeting place for festivity and pleasure.
Culture	A historical place offering fascination with the course of time.

For more information regarding healing gardens, please refer to the links and references at the bottom of this document.

DELIVERABLES

Please review the **deliverables instructions** in the workshop folder:

<https://drive.google.com/open?id=1vmNthljASEj7HIstl-zuMeBbOYgxm7Lv>

BIBLIOGRAPHY

Messinas, E. and Price, D., Ed. **ECOWEEK Book#1: 50 Voices for Sustainability** [view](#)

Messinas, E. (Ed.) **ECOWEEK THE WORKSHOPS** [view](#)

Petruskeviciute, L., **Up-Cycling Space: Design Recommendations for Reactivation of Residual Urban Space** [view](#)

Links and resources

Bioclimatic Analysis - Basics:

<http://www.sbd.ulg.ac.be/academic/BioclimaticDesign/Lecture%2003.html>

Bioclimatic Design:

<http://plus.usgbc.org/bioclimatic-design/>

Passive Solar Design:

https://en.wikipedia.org/wiki/Passive_solar_building_design

Site and Bioclimatic Design (example):

<http://tboake.com/carbon-aia/teaching/guzowski/guzowski1.html>

Circular Economy

1. From linear to circular: Accelerating a proven concept



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https://reports.weforum.org/toward-the-circular-economy-accelerating-the-scale-up-across-global-supply-chains/from-linear-to-circular-accelerating-a-proven-concept/?doing_wp_cron=1588422291.5114550590515136718750

2. Ellen McArthur Foundation Design Guide in circular Economy:
<https://www.circulardesignguide.com/>
3. Expanding perceptions of the circular economy through design: Eight capitals as innovation lenses
<https://www.sciencedirect.com/science/article/abs/pii/S0921344919302824>
4. American Institute of Architects Committee for the Environment (AIA COTE) on sustainable design:
https://drive.google.com/file/d/1cKvQrRQLL8z03ss_LWB0bnMju0It1_2D/view?usp=sharing
5. Design for circular economy: developing an action plan for Scotland
<https://www.sciencedirect.com/science/article/pii/S0959652617326604>
6. Circular Economy Solutions: Green Technology
https://www.theexplorer.no/search-page/?searchQuery=circulare&numberOfItems=15&gclid=Cj0KCQjwLT1BRD9ARIsAMH3BtXZ_dkSZjIhLvtu2d6QOOhHDAbX1ZluCeukaJVZLr670iNXx2mly51YaAorJEALw_wcB
7. Beni Zvika recycling of demolition materials:
<https://www.bnz.co.il/>
8. Building with local natural materials in Romania:
<https://www.workaway.info/en/host/176878679558>
9. Construction with recycled pallets and wood:
<https://www.pinterest.es/pin/502010689695815801/?autologin=true>
10. Building with recycled wood in Romania:
<https://www.recyclart.org/wood-art-pavillion-from-recycled-pallets/>
11. Building with recycled paper:
<https://www.bobvila.com/slideshow/paper-thin-incredible-inhabitable-spaces-made-from-paper-47070#shigeru-ban>
12. The Circular Pavilion (Paris, France):
<https://www.archilovers.com/projects/171107/circular-pavilion.html>



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Legislation

1. European Commission:
<https://ec.europa.eu/environment/circular-economy/>
<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52015DC0614>
2. European Environmental Agency:
<https://www.eea.europa.eu/highlights/improving-circular-economy-practices-in>

Therapeutic Landscapes and Healing Gardens:

1. Therapeutic landscapes and healing gardens: A review of Chinese literature in relation to the studies in western countries (ShanJiang, 2013):
<https://www.sciencedirect.com/science/article/pii/S2095263513000836>
2. Physical Environment: The major determinant towards the creation of a healing environment? (Mohamed Yusoff, Roslinda Ghazali, 2011):
<https://www.sciencedirect.com/science/article/pii/S187704281102204X>
3. What are healing Gardens? (M.J. Kreitzer, University of Minnesota):
<https://www.takingcharge.csh.umn.edu/explore-healing-practices/healing-environment/what-a-re-healing-gardens>
4. Healing Gardens by Betty Severtsen:
https://depts.washington.edu/open2100/Resources/2_OpenSpaceTypes/Open_Space_Types/healing_gardens.pdf
5. Why and how to create a healing garden?:
<https://ngb.org/2017/04/11/why-and-how-to-create-a-healing-garden/>
6. Therapeutic Landscapes: the book:
<https://www.wiley.com/en-gb/Therapeutic+Landscapes%3A+An+Evidence+Based+Approach+to+Designing+Healing+Gardens+and+Restorative+Outdoor+Spaces-p-9781118231913>
7. The Future of healing gardens (Clare Cooper Marcus):
<https://journals.sagepub.com/doi/10.1177/1937586715606926>
8. The Fiona Hospital in Melbourne:
<http://landezine.com/index.php/2015/04/fiona-stanley-hospital-parklands-rehabilitation-courtyards-intensive-rooftop-gardens-hassell/>
9. What is a healthy landscape? Therapeutic gardens and public realm design in Sweden:



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<https://www.landscapeinstitute.org/blog/health-wellbeing-sweden-part-2/>

10. What makes a garden a healing garden?

https://www.researchgate.net/publication/234072230_What_Makes_a_Garden_a_Healing_Garden

11. Guidelines for Healing gardens <https://alexstark.com/healing-gardens/>

12. Colours and Healing gardens

<http://gardeningadventures-fromthegroundup.com/a-healing-garden.html>

13. Herbs in the treatment of children (Julian P. Scott & Teresa Barlow, 2003)

<https://www.uk.elsevierhealth.com/herbs-in-the-treatment-of-children-9780443071638.html>

14. Herbs at healing gardens

<https://www.urmc.rochester.edu/encyclopedia/content.aspx?contenttypeid=1&contentid=1169>

15. Herbs and healing

<https://www.victoriannursery.co.uk/Herbs--Healing/>

16. Healing garden herbs to grow

<https://www.gardenersworld.com/plants/healing-herbs-to-grow/>

17. Fruits, Vegetables and herbs (R. Watson, 2016)

<https://www.elsevier.com/books/fruits-vegetables-and-herbs/watson/978-0-12-802972-5>

18. Handbook of Herbs and Spices, 1st Edition (K. V. Peter, 2012)

<https://www.elsevier.com/books/handbook-of-herbs-and-spices/peter/978-1-84569-017-5>

19. Nuts and Seeds in Health and Disease Prevention (Victor Preedy Ronald Watson, 2011)

<https://www.elsevier.com/books/nuts-and-seeds-in-health-and-disease-prevention/preedy/978-0-12-375688-6>

The role of plants in landscape architecture:

1. Landscape Design with Plants

https://simpson.ca.uky.edu/files/landscape_design_with_plants.pdf

2. The Role of plants in Landscape Architecture:

<http://blog.landscapedesign.co.nz/healthy-living-lifestyle/the-role-of-plants-in-the-landscape/archives/86/>

3. Landscape design with plants (Brian Clouston, 1990)

<https://www.elsevier.com/books/landscape-design-with-plants/clouston/978-0-434-90234-7>

4. Design with Plants:

<https://www.rhs.org.uk/advice/design/design-with-plants>



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The plants in the educational process:

1. Garden-enhanced intervention improved BMI and nutrition knowledge of California students
<https://www.elsevier.com/about/press-releases/research-and-journals/garden-enhanced-intervention-improved-bmi-and-nutrition-knowledge-of-california-students>
2. Farm-to-School Programs Motivate School Food Service Professionals
<https://www.elsevier.com/about/press-releases/research-and-journals/farm-to-school-programs-motivate-school-food-service-professionals>
3. School-based Kitchen Gardens Are Getting an A+
<https://www.elsevier.com/about/press-releases/research-and-journals/school-based-kitchen-gardens-are-getting-an-a>
4. Ivydale Primary School by B|D Landscape Architects
<http://landezine.com/index.php/2019/11/ivydale-primary-school-by-bd-landscape-architect>
5. Rogers Environmental Studies Magnet School by Mikyoung Kim
<http://landezine.com/index.php/2013/10/rogers-environmental-studies-magnet-school-by-mikyoung-kim/>
6. The Docks School by Mikou Design Studio
<https://www.dezeen.com/2010/01/31/the-docks-school-by-mikou-design-studio/>
7. Case Study: School Grounds Improvements Design by Groundwork London
<https://www.groundwork.org.uk/projects/school-grounds-improvements-delph-primary-oldham/>
8. Plants: an ideal living material for teaching science (D. Jenkins,2015)
<https://www.saps.org.uk/attachments/article/556/SSR%20September%202015%20052-056%20Jenkins.pdf>
9. How a school garden has transformed the way we teach
<https://www.theguardian.com/teacher-network/teacher-blog/2017/sep/29/primary-school-garden-teaching-method-improve-pupil-behaviour>
10. The Benefits of Indoor Plants in Schools
<https://tropicalplantrentals.com.au/the-benefits-of-indoor-plants-in-schools>