

**EARTH CARE,
PEOPLE CARE
AND FAIR SHARE
IN EDUCATION**



*The Children in
Permaculture
Manual*

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TESTIMONIALS

“Earth care, people care and fair share can serve as principles for all seasons and all professions. If incorporated into the lives of enough children, and the lives of the adults who care for them, this philosophy can change the world.”

— RICHARD LOUV, author of *“Vitamin N”*,
“The Nature Principle”, and *“Last Child in the Woods:
Saving Our Children from Nature-Deficit Disorder.”*

“This is a book of its time which provides much more than the skills and knowledge that will ensure a more hopeful and resilient future. Importantly it offers guidance and empowerment for educators whose task it is to skill children today for, what is becoming increasingly apparent, to be a challenging future.

The manual is well written and researched, and speaks to us with academic credibility, sound pedagogy and an understanding of how to lead children through a comprehensive learning journey in nature. The work demonstrates how all areas of the curriculum can come to life in relevant and authentic learning situations that move from teacher centred activities to child directed practical experiences. A must have manual for every school!”

— JANET MILLINGTON AND CAROLYN NUTTALL,
authors of *Outdoor Classrooms - A Handbook for School Gardens*.

“With its homely illustrations and lively suggestions for things to do, this book will help to connect children in community with the Earth and one another.”

— Professor ALASTAIR MCINTOSH, author of *Soil and Soul*

"The manual is very well written and covers all areas of permaculture. It will satisfy the educators and has much for the teachers. It is good to take teachers beyond growing summer vegetables. It is time for this book, in fact it would have been useful five years ago."

— ROSEMARY MORROW,
author of the *Earth User's Guide to Permaculture* and
co-founder of the Blue Mountains Permaculture Institute.

"Brimming with practical examples of how to support children in connecting with themselves, each other and the growing cycle. This handbook illustrates the scope of permaculture that is relevant for children, using gardening as an entry point into wider issues of fairness and connection. Written with such a deep sense of care and consideration for the future generations, it is invaluable for parents and educators alike."

— LOOBY MACNAMARA,
author of *People and Permaculture*, and *7 Ways to Think Differently*, and co-founder of Cultural Emergence project.

"Overall the book is thoughtful, well-written and a useful addition to any educator's bookshelf."

— JULIET ROBERTSON,
Education Consultant, Outdoor Learning and Play.

"Making use of this book is a great way to start taking learning outdoors. The 'hidden potential' in the outdoors should be placed into the hands of conscious educators to a much larger extent. There it can provide a foundation for developing reflective learners and a paradigm for critical thinking and knowledge in action, not only in Europe but all over the globe. This is a must-read for anyone wanting to do permaculture with children because a muddy child is a happy child in an affective and cognitive way! I wish everyone an enjoyable, playful and fruitful time outdoors with this book."

— DR. (FIL LIC) ANDERS SZCZEPANSKI,
author of *Outdoor Education*, Assistant Professor of
Outdoor Education, Linköping University Sweden.

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INTRODUCTION

“Permaculture is the harmonious integration of landscape and people providing their food, energy, shelter and other material and non-material needs in a sustainable way”

Bill Mollison (1988)

WHAT IS PERMACULTURE?

Permaculture is a design system that creates resilient, sustainable relationships between human beings and the rest of the natural world. Permaculture uses the three ethics of Earth Care, People Care and Fair Share as the basis for decision making, which is further illuminated by the permaculture principles and design tools. These ethics and principles, once internalised, can be applied as a ‘lens’ to design any sphere of life. Thus integrating permaculture into education is largely about creatively applying the ‘permaculture lens’ to everything in the education system including designing the learning spaces, pedagogy, curriculum, sessions and social interactions.

WHY ENGAGE CHILDREN IN PERMACULTURE?

The future of our planet depends on a change of consciousness, in which the people and the resources of the natural world are no longer taken for granted and exploited without considering long term impacts. Supporting children from early childhood to develop a sensitive, compassionate and cooperative relationship with each other and the natural world is a crucial step in generating this new consciousness.

Childhood is an ideal period in which children can develop fundamental attitudes towards the world including towards nature and each other. Doing permaculture with children supports them in learning to value resources and find creative ways to live in harmony with the world. It also supports them in developing a cooperative, mutually prosperous culture rather than one based on individualistic competition for limited resources.

In the past, children often had more access to unstructured time to play outside but in recent years outdoor play has become more limited, with children spending increasing amounts of time behind screens and being taken to structured extracurricular activities (Larson, Green and Cordell, 2011; Clements, 2004). A study in England found that 90% of children do not play in natural places such as woodlands and countryside (Natural England, 2009). With such a lack of time spent in nature, children are at risk of a range of negative developmental outcomes and can experience difficulties such as sensory processing disorders, personality disorders, disorders of concentration (including ADHD) and higher rates of physical and mental disease (Taylor, Wiley, Kuo & Sullivan, 1998; Louv, 2005).

There are many benefits of playing outside, such as increasing physical activity, well-being, connection, understanding of nature, attention, concentration and confidence. This can aid academic learning, whilst reducing childhood obesity and stress (London SDC, 2011). Other benefits include improving the cognitive development of schoolchildren and reducing “Nature Deficit Disorder” that affects children’s behaviour (Dadvand et al, 2015; Taylor et al, 2011; Louv, 2005). Finally, spending time in nature as a child can lead to positive attitudes towards the environment which can remain as they become adults (e.g. Collado et al, 2015, Wells and Leckies, 2006).

Publication of a significant report on a four year, 125 school, 40,000 pupil, outdoor learning demonstration project by Waite et al (2016) concludes:

- 92% of teachers said that pupils were more engaged with learning when outdoors

- 85% of teachers saw a positive impact on pupil behaviour
- 92% of children involved in the project said they enjoyed their lessons more when outdoors
- 90% of children felt happier and healthier as a result of their time outdoors.

It is vital to consciously develop educational strategies to support children in their relationship with nature. However, simply being outside is not enough to create the optimum sensitivity, awareness and learning about the natural world. For this, positive adult role models are necessary, that can authentically demonstrate respect, awe and personal connection to nature through their own example, and can also encourage and support children to do so.

While the standard emphasis in most modern educational systems still tends to favour abstract thinking and the development of maths and language skills, our ability to understand nature's language has atrophied. It is well known that childhood is an optimal time to learn foreign languages, or to read music, as children's brains are primed to absorb multisensory information. In a similar way, learning to read, interpret and co-create natural systems is a skill that can be learned from childhood, if presented in engaging, age-appropriate and consistent ways.

Perhaps the most important reason to bring permaculture to a child's life, at least from the child's perspective, is that it is fun! Engaging children in experiential learning, often directly in contact with nature, is exciting, motivating and fascinating. It enhances the entire educational experience for children, making learning practical and alive. Moreover, it is a holistic way of supporting children to connect to themselves, others and the environment around them.

WHERE CAN CHILDREN GO OUTSIDE?

Children can benefit from visiting a nearby outdoor learning space. This may be an area within the kindergarten or school grounds, or within walking distance e.g. a woodland, community garden, park or farm. Even a very small outdoor area can be a rich resource if there are bountiful opportunities for creative play. What needs to

be taken into consideration is that the incidence of creative play is “significantly lower in barren spaces than in relatively green spaces” (Taylor et al, 1998). The inspiring book ‘Outdoor Classrooms’ by Janet Millington and Carolyn Nuttall (2008) gives many ideas on how to embed permaculture into schools.

WHAT IS THE DIFFERENCE BETWEEN OTHER FORMS OF ENVIRONMENTAL EDUCATION AND PERMACULTURE FOR CHILDREN?

Outdoor and environmental education make important contributions to a child’s development, wellbeing and learning experiences. Permaculture enriches these practices by providing a complete set of ethics, principles and design tools which can enable people to live in harmony with the earth, each other and other species, taking only a fair share to meet their needs. Once these are clearly understood, they can be flexibly applied to any field. This manual is designed to help educators understand the core ethics and principles of permaculture and give examples of applying them while interacting with children, in a variety of curricular areas. It is the result of a transnational collaborative process, of educators sharing and developing resources together. This manual is not intended to be a rigid set of instructions, but rather to give seeds to inspire creative adaptations of permaculture to suit the particular place, children, adults and natural systems.

WHO IS THIS MANUAL FOR?

This manual is designed primarily for people working with children aged 3-12 years, such as school, nursery and kindergarten teachers, as well as those working in non-formal settings such as after-school or out-of-school clubs (e.g. scout leaders). It is also intended for those already engaged in teaching permaculture to adults, that would like to be able to extend their work to children, parents (whether natural, foster, adoptive or grandparents) and others who are aware of the importance of their role in the education of their child(ren). The word ‘educators’ in this manual refers to all those adults involved in the education of children.

This manual is also a resource for Children in Permaculture

courses led by educators who have completed the advanced CiP training. For more information about CiP trainings please refer to the contacts page.

WHAT IS IN THE MANUAL AND WHY?

The Children in Permaculture pedagogy described in chapter one gives an overview of ‘how’ to engage children in permaculture with reflection questions to help educators adopt a mindful, reflective, permaculture mindset. The pedagogy is explained in more detail in chapters two and six with chapter two describing how to apply permaculture principles to education, and chapter six providing information and reflection questions to support educators who would like to know more practical details about a child-centred pedagogical approach.

The content, or ‘what’, of permaculture education is outlined in the curriculum in chapter three. It is explored in more detail in the inspirations for activities in chapter four, demonstrating the wide variety of themes and topics that can be utilised in permaculture education with children. The inspirations for activities are designed to inspire educators to facilitate activities which engage children holistically.

The pedagogy (‘how’) and content (‘what’) are integrated and demonstrated in the examples of session plans in chapter five, which are ready for adaptation and practical use with groups of children. Chapter seven suggests top tips to support schools and kindergartens in organising events which engage the wider community, and for organising larger events which include children. Finally, strategies for disseminating information about projects to a wider audience are explored in the appendix.

CHAPTER I

THE CHILDREN IN PERMACULTURE PEDAGOGY

*“The prime directive of permaculture is to take responsibility for our own existence and that of our children”
(Mollison, 1988, p. 1).*

THE CHILDREN IN PERMACULTURE (CiP) PEDAGOGY IS A HOLISTIC APPROACH WHICH ENGAGES THE WHOLE CHILD IN CARING FOR THE EARTH, THEMSELVES AND OTHER PEOPLE, AND SHARING FAIRLY. IT DESCRIBES THE UNDERLYING PRINCIPLES USED WHEN INTERACTING WITH CHILDREN, THEREFORE IT'S ABOUT 'HOW' TO PRACTICE PERMACULTURE WITH CHILDREN, RATHER THAN 'WHAT' TO DO (WHICH IS OUTLINED IN CHAPTERS 3-5).



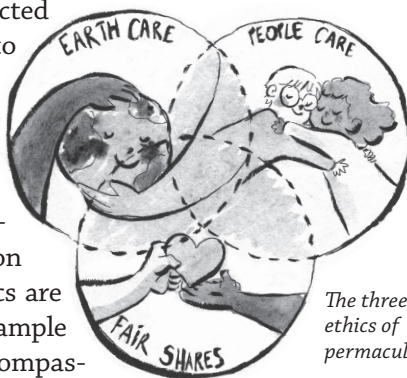
The CiP pedagogy ensures that all the needs of a child are met through the interaction between the learning environment, the educators and the children by careful observation, reflective practice and empowerment of the child. This child-centred approach encourages a natural flow which engages the head, heart, hand and all the senses; builds resilience through experiential learning; and enables children to play an active role in their learning. Through working with nature, this approach nurtures sustainability through connection to and respect for the natural world.

Below is an outline of the main points of the CiP pedagogy which can be integrated into educational practice incrementally, as even a small change can have a big effect. The starting point is the ethics, as these are fundamental for integrating permaculture into education. The permaculture principles and detailed guidelines can then be introduced gradually. It is recommended to treat the integration

of permaculture with education as a playful journey, one step at a time, moving at a pace that supports and inspires both the adults and the children involved.

1. THE FOUNDATION: PERMACULTURE ETHICS

Ensuring that the ethics are well reflected when designing sessions is central to permaculture education. Using the permaculture principle 'Design from pattern to detail' starting by reflecting on the ethics helps educators to ensure that they are really present throughout the planning and implementation process. However, ultimately the ethics are made visible primarily through the example of the adult acting in a thoughtful, compassionate and ecologically aware manner.



Including the ethics directly in the content (via stories, songs, games etc.) helps to reinforce them further.

Below, each permaculture ethic is described followed by a list of reflection questions. These questions can facilitate a critical reflection process which helps to adapt the educator's plans to better reflect permaculture, whether they are plans for formal lessons or non-formal sessions.

EARTH CARE



Earth Care is about working in harmony with nature in order to minimise negative impact and maximise positive impact upon the environment. In order to take care of the Earth it is necessary to understand natural laws, ecological systems and the needs of all living beings.

Both educators and children can think about ways to minimise the impact on the environment. When deciding on materials and

activities, it's crucial to consider the options to “refuse, reduce, reuse, repair, recycle” and/or upcycle. Using wood, stones, pine cones and other natural objects in the classroom for decoration and play helps to stimulate a greater aesthetic appreciation of nature. If studying nature, or presenting a new topic or theme, creating a direct experience can be preferable to relying on photos, pictures, information, videos or other virtual experiences. Caring for the Earth also means being mindful about how much is taken from nature, and the effect on the ecosystem of removing that item, for which the foragers' rules and ‘Leave no Trace’ principles are a good guide. These suggest to not pick rare or single plants, harvest no more than 20% of an abundant plant (leaving some for the birds and other species and enough for the plant to thrive in the future) and leave the place as you found it or a little better.

Through spending time in natural environments, children learn to appreciate nature by developing their connection to it. Therefore, it is recommended to spend as much time outdoors as possible. This can include a balance of 'unstructured' play and structured activities. As David Sobel (1996) wrote in his book *Beyond Ecophobia*, “If we want children to flourish, to be truly empowered we must first allow them to love the Earth before we ask them to save it.” When adults show appreciation of nature, this modelling helps children express their appreciation, love and awe of nature, which is also one of the foundations of permaculture.

Reflection questions for Earth Care

- How could the materials for the session be local, recycled, organic, compostable and/or low energy?
- When outdoors, how can awareness be raised about keeping the natural environment clean and making sure there is minimum impact on it? “Leave nothing but footprints, take nothing but photos”.
- How can children be guided to take responsibility to protect nature? e.g. picking up fallen leaves rather than taking from the living plant?
- How can children be involved in refusing, reducing, reusing, recycling, upcycling, composting, etc?

- If the plan is to be inside, how could some or all of the session be outdoors?
- How can children be given the opportunity to spend time in nature?
- How is nature taken care of when doing gardening, going to the woods, etc?

Example questions for children

- How can we care for living beings (animals, insects, mushrooms, plants, trees etc)?
- How can you help the tree/ earth/ garden/ worm etc.? What does it need to be happy and safe?
- Have we left behind anything in nature that doesn't belong here?
- Before we take that from the tree (or plant), is there something which is already lying on the ground which we can use instead?
- Can we recycle that?

PEOPLE CARE



People Care means taking care of others and self, thus addressing the needs of children, parents, educators, non-teaching staff and other people in the community. Cooperation, empathy, clear communication, creative expression, wellbeing, and inclusive thinking are therefore encouraged.

During the process of preparation and implementation of a session, the educator needs to remember to be mindful of the energy levels and responsibilities of all the adults involved. Being sensitive and caring in this way helps to prevent burnout. In addition, if an educator plans their session with too many activities, it can lead to adults being more focused on trying to get through their plan than on those things which arise in the moment from the children or nature. The enthusiasm or stress of the adults directly transmits to the children and influences how they perceive the whole experience. Ensuring that enough support is available for all

the educators (including oneself) makes it possible for the session to be enjoyable rather than overwhelming.

People's subsistence needs (warmth, air, food and drink) must be met before they are able to concentrate on other needs, such as learning, freedom, identity, and creative expression (Max-Neef, 1992). Therefore, in order for children to be fond of being outdoors in all weather all their subsistence needs must be met. This can be done by making sure that children have adequate clothing, there are plenty of spare clothes and there is enough shelter if it is likely to be very wet or sunny (e.g. a tarpaulin could be put up). What is most important is that the children are comfortable and enjoy themselves.

Reflective questions for People Care

- How can the educator's health and wellbeing be promoted? (Considering the amount of preparation for a session, ratio of children to educators, support from other people in the school and/or local community etc.)
- How can the children's health and wellbeing be promoted? (Is the session appropriate for the age of the children, the group size, do they get enough fresh air, exercise and opportunities to build connections to nature?)
- How can the session be designed to give space for creativity, or anything else which arises in the moment, from children, educators and/or nature?
- How are children that might need an individualised approach, including those with special needs, supported to bring out their unique strengths and abilities?
- Do all of the children have equal opportunities to actively participate, express themselves, be heard and have their other needs met?
- Is the ethic of People Care reflected in the content / experience? (Do children and adults learn how to look after themselves and/or others)?

Example questions for children

- How can we keep everyone safe?

- How can we take care of ourselves?
- How can we take care of others?
- How can we make sure that everybody is heard?

FAIR SHARE



The third ethic of permaculture, Fair Share, is about striving towards equality between people regardless of skin colour, gender, country of residence etc., and seeking equity between humans and other species.

Fair Share is also expressed as “Redistribution of surplus” (Holmgren, 2002) which is about setting limits to how much we take for ourselves, and redistributing the surplus back into the systems that care for the Earth and care for people. It also brings focus on ensuring that everyone’s contribution is appreciated, and shows awareness of taking only what is needed.

The surplus could be: food harvested from the garden, human energy, time, resources, wealth or other things which can be redistributed to benefit other living beings, present or future. For example, whilst harvesting fruits from a tree, being mindful to leave some for the birds and give some away to neighbours (e.g. a home for the elderly); or when listening to a group of children, making sure that every child has an equal opportunity to speak.

Children understand the need to be fair. The concepts of “being fair” and sharing the surplus can be explored through stories, games, songs, drama and practical experiences of sharing with other children, as well as with other creatures, plants etc. Opportunities for children to reflect, offer ideas, turn problems into solutions and/or respond to open-ended questions can furthermore help reinforce the learning.

Reflection questions for Fair Share

- How are the children encouraged to share between themselves, with other people, and with other living beings?
- How can the children reflect on the needs of other beings (e.g. whilst watering plants, making a hedgehog home etc.)?

- How can activities be designed to respect and value the abundance of nature through sharing it?
- How can children and educators work together to help other people or nature (e.g. through singing songs with older people, planting a food forest, raising funds for a charity etc.)?

Example questions for children

- How can we share this fairly between ourselves and other species?
- Who else would enjoy what we have harvested or made?
- How can we make sure that we share the listening time fairly, so everyone is heard?
- What can we give back to nature?
- What other species live here, and how can we help them?

2. HOLISTIC PLANNING

Permaculture is a holistic approach to design, therefore when engaging children, it is important to ensure that they have a rich multidimensional learning experience. This can be done by designing sessions to engage the whole body, including a balance of the ‘eyes, hands, heart and head’. Doing this can ensure that a session is not only focused on giving information (i.e. involving just the ‘head’) which can be a common tendency. This section describes more about what is meant by each of these terms and provides reflection questions to support educators in actively involving the whole child.

The approach to learning which engages the heart (emotions), hand (learning by doing) and the head (intellect or learning from books/lectures) was first proposed by Johann Pestolozzi (1746-1827), a Swiss social reformer and educator. This approach has been espoused by many educators including Patrick Geddes who was an early pioneer of environmental education (Higgins, 2001). The CiP pedagogy includes these three aspects, and additionally emphasises observation in the form of ‘Eyes’.



EYES

The permaculture principles were derived from deep observation of the natural world and truly sustainable societies. The first permaculture principle is ‘Observe and Interact’ because observation is key to good permaculture design and “careful observation and thoughtful interaction provide the design inspiration, repertoire and patterns” (p13, Holmgren, 2002). It is from knowing and understanding natural systems and patterns, that permaculture designers can be inspired for their own ideas and creative solutions. Thus the CiP pedagogy puts this emphasis on the need for immersion from an early age, symbolically represented here as ‘eyes’, and yet really referring to a deep observation involving the whole body and all the senses. There is an interplay of observation between the educator and child, where the educator observes him/herself, the child and the environment and vice versa. Whilst the ‘eyes’ are naturally located within the head, the difference in the style of learning through direct observation using all the senses is sufficiently distinct to warrant this emphasis.

The five main senses (identified by Aristotle and others) are sight, touch, taste, smell and sound, which can all be easily included in sessions with children. In addition, researchers have recognised many more such as a sense of balance, proprioception etc. It is possible to explore some of these other senses in games with children.

Children can engage the ‘eyes’ through activities which include seeing, smelling, touching, feeling, hearing, listening, tasting, observing, spotting, watching, holding, looking for and more.

Reflection questions

- Is it possible to take some time to observe the children and their individual needs before creating the objectives?
- Are the children given opportunities to use all their senses mindfully to directly experience their environment and discover things to be curious about?
- In what ways can an educator provide space/opportunities/time for the child to observe a plant, animal, stone, soil etc.?



HANDS

Practical, authentic experiences are essential in permaculture education. Through 'learning by doing' as much as possible, children interact with real, natural objects and in natural environments. This way children build practical skills in Earth Care and People Care, as well as gross and fine motor skills.

Children can engage the 'hands' through activities which include collecting, creating, using tools, making, experimenting, playing with, learning skills, painting, drawing, carrying, running, harvesting and more.

Reflection questions

- | |
|--|
| • What practical, hands on activities have been designed in? |
| • Are there activities that involve movement? |
| • Is the whole body involved? |
| • Have abstract ideas (that have been presented) been translated into practical experiential activities? |
| • What skills are being learnt through doing? |



HEART

Experiences that engage the children's emotions and sense of wonder; that evoke joyfulness, awe, love, respect and gratitude are essential for engaging the 'heart' in holistic education. These experiences will enhance the memorability of the session and reach the child on deeper levels. As American author Helen Keller (1905, p203) stated, "the best and most beautiful things in the world cannot be seen nor even touched... just felt in the heart."

Children can engage the 'heart' through activities which include singing, hearing, or telling stories, celebrating and imagining; as well as through artistic and/or aesthetic experiences. When exploring nature, reflecting on related metaphors can also enrich the 'heart'. For example, the white blanket of snow covering the forest can elicit a feeling of purity, or a child could watch a caterpillar pupate then become a butterfly, and through stories or poems explore the concept of transformation and change. Metaphors based on

nature inspire many folk tales and are a traditional way of passing on wisdom and meaningfulness.

Reflection questions

- What opportunities are there to experience gratitude, empathy, love or respect for nature or each other?
- How will children express themselves?
- What kind of experience will children have in this session, to feel connected to nature, others or their own emotions?
- What metaphors, stories, poems, songs or other expressions can be used to awaken the imagination, emotions and connection to nature?
- How can celebration be brought into the experience?



HEAD

This is where the educator can go more deeply into the interests of the child and support him/herself by researching background information or guiding the child(ren) to find more information. Logical thinking and cognitive development can be stimulated through exploration, questioning, and sharing of information, learning new vocabulary etc.

More interesting learning opportunities may evolve than those initially planned. Documenting such unplanned developments when they occur can ensure that learning can continue to build on these experiences in future sessions. 'Head' activities can include activities that give opportunities to learn, describe, identify, discuss, find out, think, list, sort, compare and contrast.

Reflection questions

- What are the main learning directions planned?
- What information do I as an educator need to explore, or learn about, either beforehand or together with the children, in order to enrich the experience?
- Have open-ended questions been designed into the session plan in order to stimulate critical and creative thinking, analysis, discovery, curiosity, and to support the children's own thinking?

3. NATURAL FLOW

This section helps to structure the learning flow during any one session, in an organic way that takes its inspiration from nature: **“sowing”** the seeds of inspiration and motivation for the session theme, **“growing”** which develops the theme through multi-sensory activities and **“harvesting”** which brings closure and helps to more deeply assimilate the experience by taking time to appreciate and reinforce the learning. The natural flow stages were inspired by the Neohumanist Education Curriculum developed by AEN in Romania (Deshaies, Zambet, Halaicu, Alexa, 2012).

Reflection questions

- Does the session flow in a natural, organic way?
- Is the session using a good balance of the different stages: sowing, growing and harvesting?



SOWING

The sowing stage is the initial stage of the natural flow, in which the educator or children plant the seed(s) of the learning journey and nourish it.

The ‘seed’ of inspiration for a session may come from observations of children’s interests, from a theme in the CiP curriculum or an interest of the educator which might create curiosity in the children. Children broadcast lots of seeds during play (by themselves or with other children) or during conversations with each other or an adult which an observant educator can pick up. For example children may ask questions, make comments, share their ideas and thoughts or talk about their experiences.

As so many seeds are dispersed, the educator(s) can select a seed or facilitate a dynamic process to engage the children in choosing.

“Once a seed is chosen, the educator can nourish it through metaphorically sowing and watering, by supporting and building on children’s inspirations and interests, allowing the seed to germinate.” There are different approaches to tending a seed, such as by starting a session with a song, story or game, or even just by setting up a

space in a way that will stimulate curiosity and exploration. Alternatively, the educator may choose to find out what the children already know by having a dialogue or asking questions to engage the children's interest and critical thinking.

For example, a child may ask 'What do squirrels eat?' This would be a 'seed'. The educator may then choose to facilitate a session around this question. The next session could then start with a story about a squirrel, this would be the 'sowing' stage.

The aim in sowing is to pique the children's interest, generating enthusiasm about the topic. Using a seed taken from a child is a way to empower them, ensuring the child(ren) realise that their ideas, questions and thoughts are heard and important. It is proven through extensive research that people learn best when they are happy and interested (e.g. Rose and Nicholl, 1997) so this stage is essential for learning as well as for ensuring a session is enjoyable for both children and educators.

Reflection questions

- | |
|---|
| • How will the session build on observations of the children? |
| • How can the children be the ones to "plant the seed of inspiration" for the session? |
| • What is creating the interest / inspiration to engage the children? |
| • Is attention given to using a holistic process that engages the whole body, heart and mind in a meaningful and enjoyable learning experience? |



GROWING

Growing is the central stage where a theme or topic of interest becomes a journey of exploration. This can be child or educator-led, or a combination of both. In this stage, the educators become facilitators of the children's process, in which the seedling may grow in unexpected ways. The educator is like a trellis that supports vines to grow in any direction.

To be effective, the process needs to engage the 'eyes, hands, heart and head', and be facilitated using 'eyes' - observation of

what is happening with the children and what they are noticing and engaging with most.

Keeping in mind the ethic of People Care both children's and educators' needs and inspirations will need to be met to create a harmonious, exploratory relationship between children, educators and the environment (the third teacher).

The permaculture principles, such as Use and Value Diversity, can also be helpful when developing this stage.

Reflection questions

- How can the session, and educator, be flexible enough for the children to contribute spontaneously, creatively and/or grow the session in unexpected directions to support children's leadership and participation?
- Have activities been planned to expand, enrich and support the theme introduced in the sowing stage?



HARVESTING

Harvesting is the stage in which learning is consolidated through celebration and joy. It also reflects the permaculture principle of Obtain a Yield (see chapter 3), and the ethic of Share the Surplus. Children may naturally love sharing things with parents, for example, and other ways of sharing with the community, animals, plants etc. could be explored. Ways of harvesting include children sharing their stories from the day, giving feedback, discussing what they would like to do next session (producing new seeds) and more.

Reflection questions

- How can we celebrate the experiences and yields of the session?
- Is there a game, activity or discussion that can help to consolidate the learning gained in the main growing process?
- How can the children be involved in deciding how to share the yield/ experiences with others and celebrate them (e.g. in a display, using creative arts or giving it away)?
- Is there any yield that can be shared with animals/plants that would help them, or make the environment more beautiful?

- | |
|--|
| • How can the diversity of results be listened to with interest and appreciation? |
| • What ideas and feedback have come from children? |
| • What inspirations could be integrated into future sessions to continue supporting children's ideas or experiences? |

There is a common tendency for educators to put too much focus on leading activities without starting with sowing or closing with harvesting, yet these stages are also essential in order to ensure learning is embedded and children are fully engaged, respected and appreciated.

CHAPTER II

EMBEDDING PERMACULTURE PRINCIPLES INTO EDUCATION

The permaculture principles were developed by the co-founders of the permaculture concept, Bill Mollison and David Holmgren, based on deep observation of how natural systems work. As thinking tools, permaculture principles can be applied in versatile ways to a wide variety of situations. In education they can be used to design many different aspects: the learning environment; how educators interact with children; session plans; policy; communication with parents, peers and other members of the community and much more. The benefits of applying permaculture principles to education can be multifarious and can include developing understanding of and appreciation for nature, creating more enjoyable learning experiences, deepening connections between individuals, and reducing the time, energy and other resources expended. This in the long term can generate a sustainable education system which cares for people and the Earth.

Design is central to permaculture because through careful planning, systems can be created which require minimum effort and give maximum effect - saving time, energy and other resources and creating abundance. Designing is a process that evolves by careful observation, analysis, decision making, implementation, reflection and evaluation using permaculture principles and other design tools.

This chapter explores how the permaculture principles can be embedded into education by firstly examining the twelve principles described in Holmgren's 'Permaculture Principles and Pathways' (2002) and then considering the five attitudinal principles described in Mollison's 'Permaculture: A Designer's Manual' (1988). Each principle is listed with child-friendly questions which the educator can adapt according to the situation and the age of

the child. A short explanation of the principle's original meaning is given, followed by an explanation of how it can be applied in education and finally reflection questions. The questions are posed to provide opportunities for children and educators to explore new possibilities and practice new skills. A single session does not need to encompass all of the principles listed below, rather, this is a checklist to facilitate reflection during the planning process and it may be preferable to choose one or two principles at any one time.

THE HOLMGREN PRINCIPLES

1. OBSERVE AND INTERACT:



- *What can you see, smell, hear, taste and/or feel?*
- *What's changed since the last time we were here?*
- *Let's look more closely*
- *What curious questions do you have about this?*

Permaculture design is based on careful observation, gathering information and experiences to promote understanding of nature, the landscape and the people involved. Thus permaculture food systems are information and design intensive, whereas traditional agriculture was labour intensive, and industrial agriculture is energy intensive (Holmgren, 2002). This is true of land-based designs, such as gardens which need to consider where it is sunny or shady, wet or dry, windy or sheltered, fertile or infertile, as well as all the needs of the different people who may use the space such as children, teachers, parents and grandparents. Similarly with people-based designs it is important to learn about the physical landscape as well. For example, if designing an activity for children one must know the physical environment, as well as the age, interests, background, etcetera of the children who will be attending.

There are many different things to observe, and it takes time. Slowing down to observe using all the senses is an essential starting

point for a permaculture education. Ways by which children can build observation skills include:

- Getting to know their environment, for example through collecting, spotting, silent sitting, mapping, playing and experimenting.
- Getting to know other people and themselves, for example through asking questions, listening, watching how they react and noticing how you feel when they speak.
- Expanding their knowledge base, for example by reading books, watching films and speaking with elders.

Learning to ‘read’ the language and signs of nature is a skill that can be learnt, and it begins with curiosity. For example “Why is the grass all swept in the same direction? What could have caused that?” A question like this may arise from the child or the educator as they are both learners.

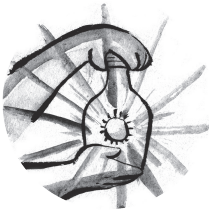
Lots of permaculture-related activities for children involve them in observing and being immersed in nature, so they can develop love and appreciation for it, get to know it, learn to understand how it works and make use of this experience now and in the future. Cultivating an ability to observe interesting details and express enthusiasm for nature (whether it’s a frog, leaf or stream) is a key part of this process.

This principle is also reflected in the approach of seeking inspiration for sessions by observing the interests of both children and educators before planning a session.

Reflection questions

- | |
|---|
| • How can the children be supported to directly observe and interact with nature? |
| • How can the children be encouraged to use all of their senses? |
| • What place-based learning could be included |
| • How can the educators observe the children and note their interests? |
| • What questions arise from the children? |
| • What systems can be set up which enable the educator to keep track of their own interests and observations? |

2. CATCH AND STORE ENERGY



- *How do animals (or plants/people) save food for different times of year?*
- *How can we catch the rain, sun or wind?*
- *How can we save energy here?*
- *How can we fix it?*

In nature most things capture energy and store some for later. For example, plants catch the energy of the sun and store it in their seeds or tubers and squirrels store nuts for the winter. Humans catch and store food energy in larders and through saving seeds to be planted next year, making jams and preserves and much more. These are all activities which children can learn to do.

Children and educators can also learn to look at where energy is being leaked and think about how to reduce wastage, such as:

- electrical energy, e.g. turning off devices when not in use.
- potential energy, e.g. water can be stored higher up than the plants in a garden, in order to reduce the energy needed to distribute it.
- the educators' energy, e.g. if there is a behaviour or action which leaves people feeling drained physically or emotionally.
- children's energy, e.g. support their wellbeing and emotional health by providing environments and tasks that interest them and fit their needs.
- time, e.g. reduce the amount of time and energy spent watering plants by capturing rainwater from the greenhouse roof.

In addition, people capture and store subtler forms of energy such as ideas, experiences and observations. Children or educators can document their experiences and reflect on them later - through photos, videos, drawings, paintings, and so on.

Reflection questions

- What activity(ies) could save or store energy?

- How are time, effort and energy being spent? Is there any way of saving energy? How can the children be encouraged to 'save some for later'?
- How can the children be involved in documenting and recording their experiences?

3. OBTAIN A YIELD



- *What can we harvest and how can we use it?*
- *If we have any extra, how could it be used?*
- *What good things did we get out of today's activities?*

In permaculture, a yield is any outcome or product which comes from an activity or thing, whether tangible or intangible. It is important to obtain a yield in order to ensure that useful rewards are received as part of the work done. Yields are not only what people take but also things that are produced or are given back, for example compost is an indirect yield of cooking that helps the garden.

There are many different potential yields from everything, for instance an outdoor activity with children could give tangible yields such as food harvested from the garden or nature art created. The intangible yields could be fun, creativity, learning about nature, exercise, promoting health and wellbeing, and developing maths, social, language or science skills.

Appreciating all the things received from the work done and that nature gives abundantly, helps everyone to enjoy their time together more. Celebrating yields together makes them more visible and can awaken gratitude for the gifts nature and people have to offer. Remembering that other species are also trying to obtain a yield can help educators to be more accepting of unexpected situations. For instance, when something eats the crop, this could be an opportunity to plan ahead to share with other beings.

Reflection questions

- What is the yield of this activity/session/project for individuals, the group, the community and/or nature?
- In what other creative ways can outcomes from the activity be shared (in addition to the outcomes that the children will directly enjoy) - e.g. with animals, plants, or other people in the community?
- In what ways could appreciation and gratitude for nature be shown?
- How can more yields be harvested from the same work?

4. APPLY SELF-REGULATION AND ACCEPT FEEDBACK



- How can we do things differently next time?
- How can we listen carefully?
- How can we check to make sure that we leave this place as it was or a little bit better?

The planet is a self-regulating system, it has kept the temperature within the limits suitable for life despite the sun getting hotter, over millions of years. Humans can regulate their behaviour if they listen to feedback from natural and man-made systems as well as to other people. For example, in the garden one can keep an eye on the temperature of the greenhouse to ensure that it doesn't get too hot or too cold for the plants inside, or check if there are too many slugs through careful observation and then taking action to reduce their numbers.

Children can learn to notice this feedback, and suggest their own ideas on how to regulate it (e.g. opening the door of the greenhouse, or bringing ducks in to eat the slugs). Educators can watch children and listen to their ongoing feedback, for example by the way that they are looking, their reaction to a proposal, seeing when they are no longer interested in an activity, or when they want to continue what they are doing. Educators can also specifically seek feedback through conversation or by asking questions to check what children felt, understood, learnt or enjoyed. This can be used to formulate a plan for later in the same session or following sessions.

Educators can also accept feedback from other educators, parents and others, and use this information to design ways to improve their communication, sessions, learning environment, systems and/or other aspects of education.

Reflection questions

- How can an activity be designed to give children an opportunity to receive feedback from each other or nature, and then reflect on how to improve?
- If a conflict arises how can everyone learn from the experience?
- How can the educator be sure to hear the feedback offered by the children, colleagues and parents?
- How can a system be set up, or changed, to make it more self-regulating and maintaining?

5. USE AND VALUE RENEWABLE RESOURCES AND SERVICES



- *Let's thank everything that helped us do our activity today.*
- *How can we use things nature makes a lot of?*
- *How can we make sure that we don't use more than nature can give?*
- *How can we avoid using things made from*

fossil fuels to do this activity?

Renewable resources are those which can easily be replenished. Things made by nature go back into nature more easily than highly processed things, such as plastics (which are made from oil). For example, a basket made out of willow will gradually biodegrade giving the opportunity to make a new one, whereas a plastic basket will take thousands of years to decompose, long after it is broken and unusable. Therefore, in general, it is preferable to use resources which are made from natural materials rather than plastic whenever possible.

Coal and oil are resources which have taken millions of years to form, so anything which uses or is made from oil is not renewable. Oil is used to make petrol, diesel and aeroplane fuel, therefore

minimising transportation is an important role of a permaculture educator. Consequently it is useful to consider this when transporting children and educators (can they walk or cycle instead?), as well as transporting foods and other goods. This is another reason for growing your own food and using it to replace food transported from afar. It is also useful to advocate for electricity to be generated from renewable sources.

The importance of valuing natural resources and services is key, and the educator's appreciation of nature and all the gifts (services) nature brings will positively affect children. If renewable resources are used excessively they will become depleted, therefore it's crucial that they are used only within their natural limits. When adults model appropriate behaviour, this will in turn affect the way children interact with natural resources.

Reflection questions

- How can children be supported to walk or cycle to school/ kindergarten/ forest/ garden?
- Is there a site that you can walk, cycle, or take public transport to, rather than take the car or plane?
- How can natural, local materials be sourced for this activity?
- Have plastic and other non-renewable resources been avoided where possible?
- If power is required, how is it possible to generate it from renewable resources (pedal power, solar, wind etc.)?

6. PRODUCE NO WASTE



- How can we use that again or how else could this be used?
- Is there a better place for this than the bin?
- How can we throw fewer things away?
- How many things do we use that are made from recycled materials?

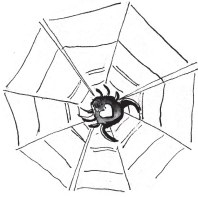
This principle reminds people of the value of being frugal with resources, caring for material goods, reducing pollution, and turning waste into resources. It relates to the saying ‘one man’s rubbish is another man’s treasure’. Ways to reduce waste include using all resources wisely. The ‘five Rs’ can be a helpful mnemonic - refuse, reduce, reuse, repair, recycle. For example, ‘waste’ such as plastic bottles can be reused or ‘upcycled’ to make something else such as a bird-feeder (rather than using new materials), or kitchen ‘waste’ can be turned into compost. Inviting and integrating different people and their ideas in the process can help to empower them and build community and better systems.

By supporting children to use recycling bins, scrap paper trays (so paper is always used on two sides) and compost buckets, they are encouraged to reuse and recycle. Children can also learn about recycling by using and pointing out products that are made from recycled materials (toilet paper, paper, clothing) or making arts and crafts from pre-used items. Parents and other members of the community can be included in exchanging, reusing and upcycling items such as toys, clothes, books, sports equipment and so on. This could be done through a second-hand market day organised by the children, a raffle with second-hand items as prizes or furniture upcycling workshops for families and community members.

Reflection questions

- How can you plan activities that minimise, and preferably eliminate, unnecessary waste?
- How can children be involved in cleaning, fixing, maintaining and/or taking care of tools and other resources?
- How can ‘waste’ be used again to create something new?
- How can you use all the outputs from one thing/activity?

7. DESIGN FROM PATTERN TO DETAILS



- *What patterns can you spot?*
- *What topic are you interested in learning about?*
- *What things happen most days?*

This permaculture principle suggests showing or experiencing the whole system first, and then looking at its constituent parts or details later. Patterns in nature and society can be observed more clearly when seen from a distance. When designing, it is important to start with a pattern as the backbone, agree this with key stakeholders, and then enrich the design with details. This will reduce the amount of time, energy and other resources expended.

As Roman Shapla (2014) the founder of ‘Permaculture for Children’ from the USA, says “First think big. Then think small”. To exemplify the saying ‘Can’t see the forest for the trees’, one could first ‘see the forest’ by climbing a nearby hill to view it, then notice the general shape and hue of one tree, and finally examine the tree’s bark, leaves and other details.

Patterns are seen everywhere in nature and they all perform a function. The main physical patterns to spot are spirals, nets, branching, waves and lobes. The spiral is an effective growth pattern seen in flowers, whirlpools, snails, tornadoes and more. The branching pattern is used for collection and distribution and can be seen in leaves, rivers, lungs, pathways and many other places. Another common pattern is the net, which catches things, creates lots of edge, is interconnected, engenders equality, and can be seen in spiders’ webs, mycelium, bramble thickets, birds nests, the internet etc. A fun way of learning about these patterns with children is to play games spotting patterns and thinking about their functions.

Viewing the bigger picture when planning sessions with children can help prevent spending too much time on details that might have not been necessary. An educator can firstly look at the programme for the whole term or year, before working out the details of the first session. In addition, when leading more

than one session with children, what will be the overall pattern or rhythm to the day or week?

Human behaviour also follows patterns which enable us to make a complicated decision in a fraction of a second, and some are more helpful than others. When communicating with adults and children it can be useful to think about one's own behaviour patterns. As an educator, observing how one reacts to children's behaviour and considering whether there could be a more beneficial pattern can be an initial step towards understanding each others' needs, creating a more relaxed atmosphere and engendering a deeper connection between oneself and the children. Similarly, noticing children's behaviour patterns can help to identify the cause of a problem, for example if a certain child has a tendency to start to become angry at 11am, could it indicate that they are hungry?

Reflection questions

- How can educators create an opportunity for children to look at the big picture before focusing on its parts?
- What patterns can you spot? Can you see the same pattern repeated in different places and times?
- What will be the overall pattern or rhythm to the day?
- When leading more than one session with children, what will be the overall pattern to the whole period you will be together (e.g. one term, one year etc)?
- If coming across a repeated problem, is there a different pattern which could be more beneficial?

8. INTEGRATE RATHER THAN SEGREGATE



- How can we help each other?
- How can we get things to work together?
- Is there something which we could add in that would make this even better?
- You have lots of ideas, how can we bring them together?
- Is everyone able to join in (with our circle, game etc)?

This principle brings an awareness that in nature the connections between things are as important as the things themselves, as per the saying ‘the whole is greater than the sum of its parts’. This encourages us to try to find a place for each part, to create relationships of support and cooperation. In a garden, that can mean finding different types of plants that will support each other, whereas in a session with children it can mean finding how each child can contribute to the whole group with their own skills and interests. Remembering that everything and everybody is important and has a special place and role, can prevent someone or something being left out and can ensure inclusion.

Two statements within permaculture literature relate strongly to this principle:

- Each important function is supported by many elements
- Each element performs many functions

where an element is an entity such as a tree, child or pond, and a function is what it does. The function or effect of any entity is equal whether or not it is desired i.e. there are no ‘side-functions’ as there are ‘side-effects’ in medicine. For example, a tree gives out oxygen, provides shelter, offers food, gives shade, reduces flooding, prevents soil erosion and much more. Both these statements can be considered when designing sessions with children, where one activity (element) can meet many different needs at the same time. To give an example from education, whilst playing hide and seek in a woodland, children can be practicing counting (maths), building communication skills, getting fresh air and exercise, connecting to nature, developing hiding skills, learning about perspective, all whilst having fun (and not even realising they are learning!).

Reflection questions

- Can we integrate different aspects of learning into one activity?
- As it is important to include everybody, consider questions such as “What are the vegetarian options?” “Will our Muslim friends be able to participate equally?”
- How can you involve the children in making everybody feel safe, important and included?

9. USE SMALL AND SLOW SOLUTIONS



- *How can we slow down and really enjoy this?*
- *Where do we start?*
- *If that's your dream, what could we do first?*
- *Let's take our time and go step by step.*

This principle encourages people to take the time that is needed, and to complete one step before going to the next. 'Small scale solutions and activities are more likely to be adaptive to local needs, respectful of nature and able to see the consequences of actions ...Incremental changes can be more easily understood and monitored.' (Permaculture Association, 2018). There are several sayings which relate to this principle such as:

- 'More haste, less speed', which means that when people hurry they can end up taking much longer, because something drops, is broken, is forgotten or is overlooked at the beginning.
- 'Small changes can have a big effect' means that small manageable steps can be more effective and sustainable than spectacular ones.
- 'Slow and steady wins the race', which children can learn about through the story of 'The Tortoise and the Hare'.

A common tendency when embedding permaculture into a new setting is to try to change or introduce many things at the same time. However, a practical permaculture design includes a realistic timeline that starts with an achievable first step. A system set up this way can be well-managed for some time before moving on to the next step.

For example, when teaching children to light a fire one can start with fire safety rules and the adult lights the fire. The next session children can be invited to make a very small fire with a flint, steel and tinder. In the following session children can make a larger fire with wood, and once they demonstrate good fire safety skills they can start cooking on the fire, experimenting with different tinders and collecting kindling etc.

Making sure that the session is moving forward one step at a time from where the children are at, without making too big a leap, can help to keep everybody included and involved.

Reflection questions

- How can you plan activities which create opportunities to slow down and find solutions that require patience and time?
- Are you realistic about the time the activity needs? Is there enough space for spontaneity and reflective time? Remember, every moment does not need to be filled.
- Is the session plan appropriate for the children's age, developmental stage, background knowledge, culture and experience?
- How can you get enough feedback during the session to inform the educator whether the group can carry on and go for the next step?
- Are you embedding permaculture to your setting in small steps/stages?

10. USE AND VALUE DIVERSITY



- How many different types of plants (or animals, seeds, insects etc.) can we spot here?
- Why is it useful for there to be lots of different types of animals (or plants, people, interests, habits etc.)?
- Who can we invite from the community to help with our project (or activity, garden etc.)?

In nature and humans there is incredible diversity in form, function, needs and interactions. Form is the visible shape or appearance; functions are what they do; the needs are the amount of sun, shade, heat, food, air, water etc. required; and interactions are the way that two or more beings or things communicate with or react to each other.

This diversity exists both between species and within species, such as varieties of plants or animals which have been grown to suit local conditions. This diversity is essential for life to thrive, be resilient to pests and disease and adapt to change. All sorts of plants, animals, bacteria, fungi and people are needed for a healthy, resilient system. Therefore the more different types of plants, animals or people in a place or system, the healthier everything will be.

It is crucial that children experience diversity. This can be through a wide spectrum of opportunities including meeting or playing with

children from different cultures, ages and backgrounds or spending time with elderly people. It is also useful to help children to appreciate what different people, species, breeds or varieties, have in common, as well as their differences. One way of experiencing this could be to have a conversation about food allergies: everybody needs to eat, but some people get very ill if they eat certain foods, which other people can eat safely.

If an adult models an attitude that if a thing, habit or person etc. is different they are still valuable, children will be encouraged to be similarly accepting. Everything can contribute in its own way. Equally, plants that some gardeners consider to be 'weeds' can contribute important nutrients and improve soil for the other plants, such as dandelions which supply nutrients and break up compacted soil with their long roots. Children can learn to appreciate different plants including 'weeds' through eating them or making other products such as herbal remedies, soap or dyes.

Reflection questions

- How can the educator(s) encourage children with different abilities to contribute and ensure they feel valued?
- What ways are there to notice and appreciate diversity of people and nature?
- What ways are there to include people of different ages, genders, ethnicity, cultures, backgrounds, languages etc.?
- How can different educational approaches and holistic activities be included to ensure the children's diverse needs are met, such as play, movement, reflection, understanding, and so forth?

11. USE EDGES AND VALUE THE MARGINAL



- Where do you see edges in nature? What is happening there?
- Where can we see the most different types of birds (or flowers, trees, insects etc.)?
- How can we make the playground even better?

Sometimes the most interesting things happen where two different things meet - that meeting place is called an edge. New things and more varieties happen in those edges. For example, the most diverse places in nature are in the edges between different habitats, such as an estuary where salt water, fresh water, air, soil, and sand all meet. They are diverse because they will meet all the needs of a species which requires only one of these habitats, as well as the species which require more than one, for instance a bird which needs a tree to nest, fresh water to drink, seas to fish, and air to fly.

There are edges in learning: the edge between the known and the unknown, the edge between people of different abilities. Encouraging peer-to-peer support can help children to learn cooperation, and prevent those who need more time from being left behind.

The playground at a school is an interesting edge between the classroom and the wider world. In many countries, a school teacher can take a whole class into the playground without requiring the additional staff or permissions which would be required if going off-site. Therefore, creating diverse spaces and gardens for outdoor learning on school grounds, is an accessible solution which allows children to experience child-led, practical learning, outdoors, every day. Such an outdoor learning space maximises the edge between the child and nature increasing the fertility of the educational experience. A local permaculture designer can help to design and create such a space for kindergartens and schools. How to create an outdoor learning space is explored in more detail in the inspirational 'Outdoor Classrooms' book (Nuttall and Millington, 2008).

In the 'margins of society' there are many children who have a different experience at home, school or elsewhere. These include children who are home-educated, have lost a parent, are refugees, are fostered, speak a different language, are homeless, along with many others. It is important to value these minority experiences and to be sensitive in order to avoid assumptions or stereotyping.

Reflection questions

- What edges can be explored or discovered?
- What nature can be found right here - in the playground, city, school, home or park?
- How can people who live on the edges of society or who are minorities be valued and/or included?
- In a garden, how can paths be designed to enable children to reach everywhere without treading on the vegetable beds?
- What meeting places can be created for ideas that would otherwise not be valued or heard?

12. CREATIVELY USE AND RESPOND TO CHANGE



- *When new things come up, what can we do?*
- *What could we do when we disagree with our friends?*
- *How many different ways can we solve this?*

In nature everything changes as conditions alter and life-cycles progress. In a process called succession, if a field were left bare without people interacting with it, within a few weeks there would be many small annual plants growing; in a few months larger perennial plants; within a year or two tree saplings would be growing amongst the perennial herbs and bushes. In some more years it would become a forest.

Similarly, as a child grows they become interested in different things, as they change cognitively and developmentally. In permaculture education, educators can plan to make use of change in an intentional and cooperative way by observing children and supporting them according to their individual needs as they change over time. In this way they can be supported to thrive in each stage.

As children grow, they leave the kindergarten or school. An educator can plan for this change by setting up a 'buddy system' to

ensure that all the knowledge and skills older children have gained, such as what, how and when to do work in the garden, is shared with younger children before they leave.

This principle is also about creatively responding or adapting to spontaneous or unpredictable change. Modelling positive reactions to things that arise in the moment is very helpful for children to learn from. If it rains when the forecast was dry, the group can play in the puddles and make dams, or if a bird appears, educators can take some time to appreciate that gift from nature. Similarly if a child wants to do something that wasn't planned it could be possible to integrate that idea into the day.

Reflection questions

- What ways are there to integrate things which come up in the moment, to 'go with the flow' and to use, respond and appreciate a yield from them?
- How can children be supported in ways of meeting their own needs when there are changes (to the routine, project, plan, day or place)?
- How do we adapt to change and communicate the new situation with colleagues and/or children?

MOLLISON'S ATTITUDINAL PRINCIPLES

These principles were taken from the book 'Permaculture: A designer's manual' by Bill Mollison (1988) who was one of the co-founders of permaculture. These are the attitudes that underlie and define the permaculture approach to design, and thus are important to consider when designing sessions.

I. WORK WITH NATURE, RATHER THAN AGAINST IT



- *What would nature do here?*
- *How would you feel if you were that tree? (or frog, dragonfly, rock etc.)*
- *What do you like doing?*
- *How can we make sure that the things we do are OK with nature?*

When a person impedes natural systems, patterns, processes, and evolutions, or otherwise works against nature, there will always be a battle. Instead, working out what nature would do and then allowing or assisting that process will reduce work, and it will be more enjoyable. Water flows downhill, for instance, so catching the rainwater higher than the garden then allowing it to flow down to where it is needed is easier than catching it at the bottom, thus needing to carry it up the hill. Nature always covers bare soil with new plants, therefore keeping soil covered with plants or mulch will reduce the work required to remove unwanted plants. In the case of a wetland, choosing plants which thrive in a wet environment will use far less energy than draining the wet place to make space for dry-loving plants.

Each child is unique with different needs, likes and dislikes, skills and abilities. Considering these when planning a session can enable an educator to work with the nature of that child or group of children. By way of illustration, if a child needs more movement

than others the educator can support them by suggesting a task or role which involves movement, working with the nature of that child. Children can be encouraged to share their different skills and preferences with other children.

Reflection questions

- What is the nature of this child, and how can the educator work with it?
- How can children be supported to work with the nature and properties of the site, species or tools with which they are interacting?

II. THE PROBLEM IS THE SOLUTION (EVERYTHING WORKS BOTH WAYS)



- What are the causes of this problem?
Let's find a way to solve this.
- What is the good side of this problem?

As with the saying 'every cloud has a silver lining', it is possible to see solutions within problems. For example, if there seem to be too many slugs in a garden, one could introduce ducks as they will eat slugs happily. Involving children in working out solutions encourages a positive 'can do' attitude, empowering them to take action to find solutions to situations that they may come across during life.

Often one can put together two problems to create one solution. To illustrate, there was a problem of people dumping rubbish which included roof tiles in one location, and a problem of a large mound of soil in another. Putting these together with some children made a beautiful herb spiral in a Children's Garden.

Reflection questions

- How can children have the opportunity to do creative problem-solving, or look at a problem in a new way?

- How can something that originally seemed to be a problem be turned into something beneficial?
- Are there ways to involve children in welcoming challenges or difficulties?

III. MINIMUM EFFORT FOR MAXIMUM EFFECT



- *How can we let nature do the work here instead of us?*
- *How could we travel or carry things without using petrol or diesel?*

Also called “Make the least change for the greatest possible effect” (p15, Mollison, 1988), this principle encourages the designer or educator to spend as little of their own energy as possible, in order to get the greatest yield (where yield is defined in principle 3 above). Often people can think up big and complicated solutions, when something much simpler would actually suffice. There are situations when it is possible to take two things which were separate and place them together in a way that allows the outputs of one system to become the inputs of another system, thus getting maximum effect with minimum effort. To illustrate, in a cold climate if a greenhouse is attached to the sun-facing side of a chicken shed, the heat output from the chickens will go into the greenhouse extending the growing season, and the unused parts of plants from the greenhouse can be used to feed the chickens.

The use of fossil fuels often makes work seem easier but burning these fuels is actually using huge quantities of energy, for example driving a tractor to cut a hedge uses much more energy than using hand-held hedge trimmers because the tractor itself has also to be transported with all the extra weight and friction. Similarly, planting and mulching a fruit tree with a few companion plants is much less work than sowing and tending annual vegetables and can eventually give a higher yield.

Reflection questions

- Are there ways to use less energy to achieve the same effect?
- How can nature do the work instead of you or fossil fuels?
- Is a new multipurpose building necessary, or will tarpaulins for shelter in the forest and existing buildings be sufficient?
- How can things which need frequent care be placed in a location that you pass most days?

IV. THE YIELD OF A SYSTEM IS THEORETICALLY UNLIMITED



- Let's imagine the many different things we can do with, or make out of this
- Can you suggest a new use for this, that we hadn't thought of before?

In permaculture, yield is thought of in terms of all the things that we can get out of it whether physical, educational or emotional.

This principle is also expressed as 'The yield is limited only by the imagination or knowledge of the designer' because often when a new person visits a site they can see new yields which can be taken from the same system. An example of this is when a gardener believes they are taking all the possible yields from a food forest, then an educator arrives and suggests that they install a box to allow barn owls to nest there, or that they bring a group of children to learn all about food forests and connect with nature. Thinking about all the potential functions can help more yields to be harvested and appreciated from the same system.

Reflection questions

- How can more yields be achieved from this same activity or system?
- How can children be included in thinking about new ways of using resources?

V. EVERYTHING GARDENS (OR HAS AN EFFECT ON ITS ENVIRONMENT)



- How is this stone (or plant, animal, tree etc.) changing its surroundings?
- What are the things that this plant (or animal, insect, tree etc.) does that helps other plants or animals?
- What things does this insect (or animal, tree etc.) do to make their life easier?

When people garden they are changing their environment to get particular results. This principle refers to the way that everything is constantly influencing its environment (sometimes with an aim for particular results). For example, stones change their environment by providing a habitat for minibeasts, by casting shadow on one side and by absorbing the sun and radiating it back out at night. Children and educators could play a game such as the Web of Life to discuss what any one thing does and how that affects everything else, e.g. worms eat dead leaves, excrete, breath and that enables plants to live, therefore animals to live.

Children are constantly affecting their environment and with support they can learn to have a positive influence. To illustrate, if children build a dam across a stream, at the end of their play, the educators and children can discuss whether the dam should remain or be dismantled. They can imagine what will happen in the next heavy rain. Often it is good to slow streams in heavy rain, as it can prevent flooding downstream, but sometimes the dam could divert the stream into an inappropriate place (such as someone's house).

Reflection questions

- | |
|---|
| • How can contributions from the children be included, as they also garden (and can educate adults and other children)? |
| • How can nature educate the children? Is it possible to make use of what appears spontaneously in nature? |
| • How can children and educators work together to make sure that their influence is positive? |

SUMMARY

In summary, both Holmgren's and Mollison's principles can be used as a lens to view the entire educational system: re-designing the way educators are with children, the activities which are led, the materials used, the spaces, the amount of time spent indoors and out, how educators communicate with parents and colleagues, and more.

CHAPTER III

THE CHILDREN IN PERMACULTURE CURRICULUM

The Children in Permaculture curriculum is a framework for considering all the different areas of permaculture with children. It is innovative as it has not been expressed in this way before, and gives clarity on pedagogical appropriateness for two different age groups. The CiP curriculum was created to give a comprehensive overview of the full scope of permaculture for children, choosing themes that are enjoyable, interesting and meaningful as well as enabling children to experience, understand and connect to the natural world. The themes were brought together under a canopy for children and educators to gain the tools to live sustainably in a changing world.

The curriculum outlined here is the foundation for chapter four, which lists activities that can engage the ‘eyes, hands, heart and head’ for each sub-topic.

The Children in Permaculture curriculum was created by adapting the Permaculture Association’s (Britain) Permaculture Design Course (PDC) curriculum for adults. This PDC curriculum is based upon the curriculum initiated by permaculture’s co-founder Bill Mollison, so it is the internationally recognised standard for teaching permaculture and demonstrating that one has an understanding of permaculture. This PDC curriculum is clearly laid out and has been trialled in 30 years of teaching permaculture. The Permaculture Association (Britain) recently updated it, therefore it now reflects the current best practice of permaculture education in Europe.

The CiP curriculum is also based upon the work of the main representatives of the Children in Permaculture project, feedback from educators working in diverse fields across Europe with different



Fig. 1

educational systems and climates, and with reference to Nuttall and Millington's pioneering 'Outdoor Classrooms' book (2008).

The CiP curriculum is organised into six themes, which are subdivided into 15 topics, which are further subdivided into sub-topics (see Table 1). The six broad themes are a collation of a range of PDC topics, and give a coherent overview to the content of permaculture education. These themes are:

- Introducing Permaculture
- Living Nature
- Designing
- Growing Food
- Built Environment and Resource Use
- Social Permaculture

By simplifying the breadth of permaculture into child-friendly themes, it is intended to make it engaging for children yet also holistic and all-embracing.

Each theme is divided into topics. There are 15 topics in total, all of which are relevant to people of all ages. For example the theme 'Introducing Permaculture' is divided into two topics:

- Permaculture Ethics and Principles
- Connections

On page 56, the table 1 shows that each topic is further subdivided into sub-topics. Sub-topics are included in order to go into greater depth; inspire educators; give age-appropriate resources; and provide educators with a clear overview of permaculture content.

All of the sub-topics which are relevant for 3-6 year olds are also relevant for children aged 7-12 years, but not vice versa. For example, the sub-topic 'The permaculture ethics: Earth care, People care, Fair share' which is listed for 3-6 year-olds, is also relevant for children aged 7-12 years (though it may be explored through different activities). However the sub-topic "What is permaculture?" (which is for 7-12 year olds) is not considered appropriate

for children aged 3-6 as it may be too abstract for that age, when more emphasis is on play.

In nature all systems are interconnected, similarly there are overlaps and interconnections between themes, topics and sub-topics in the CiP curriculum. A clear example of this can be seen between the two themes 'Living Nature' and 'Growing Food' which are both about plants. When discussing plants in the theme 'Living Nature', the sub-topics are about how plants grow without human intervention, yet in the theme 'Growing Food' sub-topics are about how people tend plants in a permaculture system. This interconnection is to be expected in a permaculture curriculum which follows nature's patterns.

Table 1

THEME	TOPIC	SUBTOPICS 3-6 YEARS:	SUBTOPICS 7-12 YEARS (IN ADDITION TO THOSE FOR 3-6 YEARS):
A INTRODUCING PERMACULTURE	1 PERMACULTURE ETHICS AND PRINCIPLES	• The permaculture ethics: Earth care, People care, Fair share	• What is permaculture? • The permaculture principles (Mollison's and/or Holmgren's)
	2 CONNECTIONS	• The big family of nature: All of nature is connected • Spotting patterns	• The web of life • Seeing the whole picture • Exploring patterns
B LIVING NATURE	3 SOIL AND STONE	• Exploring soil and soil life • Stones • Experiencing different landscapes	• Soil textures and soil tests • Indicator species
	4 WATER	• Playing in water • Catching and saving water • Water for life	• The properties of water • Water ecosystems
	5 PLANTS AND TREES	• Exploring and naming plants and trees • Bushcraft • Fire	• Creating arts and crafts from natural materials • Discovering the properties and uses of different wild and cultivated plants and trees
	6 THE ANIMAL, FUNGUS AND BACTERIA KINGDOMS	• Animal families, homes, names, footprints and other signs • Mushrooms	• The Microscopic World • Fungi: parasites, recyclers and the wood wide web • The animal kingdom: patterns, functions, relationships
	7 AIR	• Weather • Breath	• Measuring weather • Microclimates • How climate affects habitats and cultures • Stars, planets, moon, sun
C DESIGN	8 DESIGNING	• Creative expression • Making choices • Seeing and sharing designs	• Surveying the landscape and people • Analysing what you found out • Designing and deciding • Implementation - making it happen • Maintenance - looking after your creation

THEME	TOPIC	SUBTOPICS 3-6 YEARS:	SUBTOPICS 7-12 YEARS (IN ADDITION TO THOSE FOR 3-6 YEARS):
D GROWING FOOD	9 GROWING FOOD	• Helping to grow food • Caring for soil • Food forests • Animals in permaculture	• Growing food the permaculture way • Companion plants and nutrient givers
	10 PREPARING FOOD	• Helping to prepare food and eating together	• Planning and using harvests which are grown or foraged • Cooking and baking • Food hygiene • Healthy eating
E BUILT ENVIRONMENT AND RESOURCE USE	11 BUILDINGS	• Homes • Exploring and building with natural materials	• Shelter • Biomimicry • Insulation and draught-proofing
	12 USING NATURE'S GIFTS WISELY	• Hand crafts • What happens to our waste?	• Where resources come from and the effects of their use • Fossil fuels, climate change and peak oil • Ways to use less: refuse, reduce, reuse, repair, recycle • Finding solutions for sustainable living
F SOCIAL PERMACULTURE	13 MY BODY, HEART AND MIND	• Taking care of my body, heart and mind • Feelings, needs and thoughts • Quiet time	• Ways of learning • Self-awareness • My passions and interests • Self-expression through body, heart and mind
	14 MY COMMUNITY	• Communication • Families, neighbours and friends • Playing together and sharing	• Living in community • Group decision making • Resolving conflict • Teamwork
	15 OUR HUMAN FAMILY	• My human family • Many languages and cultures • Peace and harmony	• Peace, diversity and harmony in the world • Ethical trade and exchange • Careers and work in permaculture

CHAPTER IV

INSPIRATIONS FOR ACTIVITIES

This chapter expands upon the CiP curriculum's sub-topics, giving one-sentence ideas to inspire educators to facilitate activities which can engage children holistically, using the 'eyes, hands, heart and head' approach described in chapter one. Educators can then elaborate on these ideas to develop session plans based on the children's present interests or ongoing inquiry projects. Some of these may require additional permaculture knowledge or skills, in which case support may be sought from a local permaculture organisation or CiP practitioner.

Naturally, there are infinite possible activities, so these lists are not intended to be exhaustive or limiting. Rather, this chapter offers seeds to inspire educators around the world with ideas about how to engage children in permaculture and to help them work with the nature of the child. Typically, in the process of working with children, many more ideas and inspirations will appear both from the children and the educator and these too can be nurtured into full session plans. Some of the ideas brought together and shared have been inspirations from children themselves. Due to space constrictions, this chapter only lists 'Inspirations for Activities' for five of the topics in the CiP curriculum. These topics are the ones identified in the Survey of Resources for Engaging Children in Permaculture (Alderslowe, Amus, Cifarelli, Deshaies, Dumitrescu, Kastelic, Petru and Velehradská, 2016) as the areas with the fewest existing resources, and thus where permaculture can offer the most added value. These topics are '1. Permaculture Ethics and Principles', '2. Connections', '3. Soil and Stone', '8. Designing', and '9. Growing Food'.

More Inspirations for activities for these topics, and for those relating to the other topics, can be found on the CiP website (see contacts page).

A. INTRODUCING PERMACULTURE

1. PERMACULTURE ETHICS AND PRINCIPLES

The permaculture ethics of Earth Care, People Care and Fair Share are the core of living an ethical, sustainable life in harmony with nature and other people. These three ethics can be invited into a child's life through stories, songs, role-modelling, and experiencing an environment where these ethics are embedded and practiced. The ethics are a powerful tool which can be used to embed permaculture into the whole school, kindergarten, home, or any other situation. They are understandable from an early age and can be used to consider whether a particular story or real-life situation gives an example of taking care of the Earth, taking care of people and/or sharing things fairly. In addition, older children can be introduced to the permaculture principles, which could support them to understand the natural world, learn from nature, see things holistically and apply their learning to designs and other decisions.

**3-6
YEARS**

The permaculture ethics: Earth Care, People Care, Fair Share



- See and hear people supporting each other to feel well (e.g. a check-in circle).
- Notice ways that plants tell us what they need (dry soil, wilting leaves, yellow leaves, sick leaves).



- Learn skills related to caring for the Earth, e.g. watering plants, taking care of compost, feeding animals.
- Take care of own needs and those of friends e.g. massage, hugs, kind words.
- Practice sharing fairly with people (e.g. food, toys), animals (e.g. giving breadcrumbs to birds instead of throwing away) and plants (e.g. pouring leftover water onto a plant).



- Participate in daily routines around sharing with nature, e.g. offering scraps to the compost, thanking the earth and people that prepared our food; sharing fruits and saving the seeds.



- Hear stories about nature's abundance and seasonal traditions/rituals celebrating the Earth.



- Match a permaculture ethic cookie (e.g. 'people care') with an activity which the children have done that day.

**7-12
YEARS**

The permaculture ethics: Earth Care, People Care, Fair Share



- Look for good examples of Earth Care, People Care, and/or Fair Share (e.g. in a garden/design)



- Make a chart and track examples of People Care, Earth Care, Fair Share over a week.
- Make a repairs cafe - bring broken things to repair together (e.g. bikes, books, toys) instead of throwing away - to make the resources last longer.
- Practice taking care of another person for a day.



- Reflect on how behaviour can demonstrate the permaculture ethics (e.g. discuss "How did we do today in terms of people care?").
- Recite or create poems together about caring and sharing.



- See the permaculture ethics expressed in 3 overlapping circles (Venn diagram) and discuss some actions which could be in the middle i.e. meet all 3 ethics (e.g. growing food is Earth Care because there's less transport, and People Care because the food is fresh and chemical-free, and Fair Share because we aren't taking resources from elsewhere).
- Play a simulation game: Divide the group into Earth Protectors, People Protectors and the Fair Share Mediators - then give different situations - "we want to build a new dam"; each group gives their point of view, and the Fair Share Mediators try to find a win-win solution that both sides are happy with.

7-12
YEARS

What is permaculture?



- Spend time in a permaculture-inspired garden, touching, tasting, smelling the plants and animals (as appropriate).
- Go on a tour which explains how permaculture is demonstrated in that particular place.



- Make a photo collage that shows the difference between monoculture and permaculture.



- Prepare a puppet show or performance to demonstrate what permaculture is.
- With eyes closed, do a creative visualisation of a journey through a world of abundance and harmony with nature - then make drawings or write about the experience.



- Explore the idea that when you work with nature, it takes less energy, for example through discussion after having experienced two ways of collecting water for the polytunnel (one involved a lot of walking to a tap and the other is collection from the polytunnel's cover).
- Discuss the difference between want and need.

7-12
YEARS

The permaculture principles (Mollison's and/or Holmgren's)



- Observe or spot the permaculture principles being demonstrated in a particular place, such as a garden.
- Make a photo collage that shows the difference between monoculture and permaculture.



- Develop skills connected with permaculture principles e.g. 'catch and store energy' through making pickles.
- Invite children to invent their own games connected with permaculture principles.
- Plan how the principle 'Produce no Waste' can be implemented in your group/school e.g. using paper on both sides, recycling, using natural materials that will decompose.



- Sing songs about permaculture and its principles (for examples see Formidable Vegetable Sound System, 2013).



- At the end of an activity children can give and receive feedback, and think how it can be better next time.
- Discover that permaculture is based on principles that help guide our action so that we can meet our needs in a way that sustains life for us and other species.
- After an excursion (e.g. to visit a different part of town, retirement home, forest or farm etc.), discuss how the Principles 'Use and Value Diversity' and 'Integrate rather than Segregate' can help us to appreciate how each person is different and has different skills and abilities, and think about how we can make sure we include everybody.

2. CONNECTIONS

The web of life is dependent upon connections - between individuals of the same species, different species, different kingdoms, and other elements such as water, stone and air.

Experiencing the world as one big, interconnected family in early childhood through daily interactions with nature, stories and songs can lead to lifelong broad, holistic and inclusive thinking. By seeing how a system made of many diverse elements, such as a forest, enables many interconnections, children can learn that each part of a system affects the whole and how the whole can be greater than the sum of its parts.

With 4.5 billion years of experience of life on Earth, natural systems have learnt how to create resilience through the use of patterns, such as the spiral or branching patterns, see page 37. Spotting these patterns in natural and other systems and thinking about their functions can be a delightful experience and help children understand nature more fully, thus be the first steps to designing interdependent, resilient systems in the future.

**3-6
YEARS*****The big family of nature: all of nature is connected and we all need each other***

- See visible examples of interconnections (e.g. evidence of an animal eating a plant or animal, a mushroom growing out of a log).
- Spend time in a natural environment, sitting quietly to catch sounds, looking and listening.



- Hunt for signs of 'Funny Fungus' roots and fruits: look under logs for mycellium, around trees for mushrooms, on old fruit for mould.



- Experience adults demonstrating a sense of awe for the natural environment.
- Go outside and find a way to express your connection and love with a natural element (e.g. hug a tree, stroke an animal, smell a flower, play in the mud).



- Find out about fungus and explore the big family of nature.

**7-12
YEARS*****The web of life***

- See and experience diverse natural systems, with lots of different types of plants, animals, fungi and bacteria.



- Participate in the 'web of life' activity: In a circle each person takes the role of a natural element (e.g. river/oak tree/mosquito/swallow). One person has a ball of string, s/he says what connections she has to another element (e.g. swallow eats fly; bat lives in tree) and throws the string to them, whilst keeping hold of the end of the string. This repeats until everybody is connected with the string in a web. It can continue until elements have many connections. Discuss that the string represents the invisible connections between all life.



- Observe what happens if one element is destroyed (meaning the child releases the string they are holding), continue taking out the elements and observe what happens to the web of life.
- Draw, paint or model clay to show a connection between a plant or animal and something else.
- Stay overnight in the wood to get deeper connections to nature and each other.
- List all the inputs and the outputs for a common human food (e.g. a can of juice). Get creative, see how far you can go back (with inputs) and how far you can go forward (with outputs). How could you get this food, or a replacement for it, from a closed loop system, where the outputs from one thing become inputs for something else?



- Connect to your own impact on the rest of the Earth by celebrating the great things you already do.



- Think about how all living things are connected, e.g. through eating, excreting, breathing.
- Explore how all living things depend on the sun, water, soil, air, and other plants, animals, fungi and bacteria to live, through matching cards with the different elements drawn on them.

**3-6
YEARS**

Patterns



- See branching and spiral patterns in different natural systems (e.g. water, flowers, growing plants).
- Observe the similarities between human beings and other animals (eat, sleep, excrete...).
- Spot the plants, insects or birds which are abundant in certain seasons.



- Collect things which are abundant at that time of year, e.g. foraging for berries or leaves.



- Play percussion instruments together, with groups following different rhythms that combine together like an orchestra.



- Learn about the different seasonal patterns.

**7-12
YEARS**

Patterns



- See fractals (e.g. in a cauliflower or ferns).
- See the same pattern in different natural systems (e.g. the branching pattern is in trees, rivers, leaves and lungs). Try using a magnifying glass to observe closely.



- Find different patterns (e.g. wave, scatter, spiral, net, lobe) in several different systems (e.g. spirals in rivers, flowers and snails). Try to work out the function of that pattern, e.g. branching for collection and distribution, spirals for growth.



- Connect to a pattern in nature, and express it through any art form (dance, draw, paint).
- Make music together. For example, each person goes into nature to 'capture' a sound (e.g. hitting 2 sticks together, slapping water, mimicking the sound of a bird). Return to sit or stand in a circle. Each person individually presents their sound to the rest of the group. Then one person can take the role of conductor, in the centre, by pointing at someone who makes their sound, everyone keeps the rhythm going whilst different sounds are added and taken away.



- Find out about the permaculture principle 'Design from Pattern to Details' through examining a tree's branches and its leaf. Discuss how nature uses patterns and why.
- Explore patterns in daily, solar, seasonal and lunar cycles, and make a connection with how we all live within cycles large and small, and their impact on us.

Seeing the whole picture



- See the woods and the trees (literally, climb a hill to see the woods, compare with being inside the woods).



- Make a mask of a local animal or plant and become that being for a while. How does it feel? How is it affected by humans? What could people learn from you?
- Take a local issue of environmental degradation (e.g. illegal dumping of waste, trees which are going to be cut down), find out all the causes and effects of that one issue, decide on an action to help stop the degradation (e.g. write letters, make a display at school, make a petition). Act on behalf of nature.



- Find ways to express how you are connected to nature - through poetry, singing, dancing, painting, or another form of creative expression.



- Explore the many benefits which people gain from nature, such as the air being cleaned by trees, crops pollinated by insects etc. (Educators can read about 'ecosystem services' for more information)

B. LIVING NATURE

3. SOIL AND STONE

Soil is the skin of the Earth. It is a complex web of air, water, mineral (stone) and organic matter. The animals, plants, fungi and microbial life in soil create such a complex and fascinating ecosystem, that in only one teaspoon of healthy soil, there are more living beings than there are people on Planet Earth. As most plants depend on soil to provide their basic needs, soil is essential for all life. It is important for children to see, touch, feel and smell soils and stones in different landscapes, to spot the differences in the features of the soil and stones as well as characteristics that are indicated by the presence of certain plants, and to investigate those differences. Looking for opportunities to introduce children to this exciting world of soil is meaningful as it is a precious resource that everyone needs to look after.

**3-6
YEARS**

Exploring soil and soil life



- Experience walking barefoot on sand, clay, loam soil etc.
- See, smell and touch different types of soils e.g. in a forest, garden, clay pit, beach.
- Watch, touch and hold minibeasts that live in the soil.



- Play with clay, mud, sand and soil. Add water and create things.
- Create land art with earth and stones, taking inspiration from artists such as Andy Goldsworthy.
- Experiment with how water erodes different types of soil (e.g. sods, sandy soil, clay soil).



- Sing songs about worms, compost or minibeasts.
- Listen to stories about earthworms, bacteria, fungi, insects and other creatures that keep the soil healthy and happy.



- Learn the common names of common minibeasts (e.g. earthworm, woodlice, stag beetle).
- Find out what worms do (and how that helps the plants).

**7-12
YEARS**

Exploring soil and soil life



- Observe soil life under a microscope to see the diversity of life.
- Observe soil in the forest and how different elements take part in creating, building and using it (stone, trees, branches, water, animals, shade, soil life, wind, etc).
- See different soil-living species in different stages of life (e.g. egg, larva, adult).



- Identify minibeasts in nature.
- Spot different plants which can tell you about the soil, and the history of the site (e.g. nettles often grow where humans once lived and urinated).



- Dramatise life in soil in which children act as the different elements e.g. stones, minerals, water, air, humus, earthworms, fungus, plant roots, seeds, bacteria etc.
- Read or listen to mythological stories from around the world with symbolic representations of the earth. Discuss the wisdom of ancient cultures in their relationship to the earth.
- Lie down outside on the ground, eyes closed, feel part of the earth; imagine seasons passing and weather changing. Breathe deeply.



- Find out about the life-cycle of worms and other minibeasts.
- Explore the properties of soil. What is soil made of? What makes it fertile?
- Discover how humus is formed naturally in woodlands.

**3-6
YEARS**

Stones



- See, touch and collect different stones.
- Climb rocks and experience the heat and texture at different times of the day.
- Look underneath stones and see what you find (minibeasts, mycellium etc).



- Build a shelter for minibeasts from stones.
- Make artwork with the natural colours of stones e.g. grading from light to dark.
- Build a cairn together with different stones.



- Choose a stone with a pattern, colour, shape or size that you admire, then share and compare with friends.
- Listen to a story about the friendship between rocks and plants (rocks providing mineral, heat etc.).

**7-12
YEARS**

Stones



- Notice the presence of different quantities and types of rocks and stones in different landscapes.
- Compare the growth of plants grown in the open, with plants grown near large rocks acting as heat stores (all other factors e.g. soil depth, should be kept equal).



- Identify common rocks in the region.
- Put rocks in a garden to catch and store heat energy in places where it is needed.



- Hear a story of how rocks were made and are still moving very slowly.



- Explore which types of soil and stone resources are in the region and how that impacts on the different plants and animals that can live there.

**3-6
YEARS**

Experiencing different landscapes (beaches, hills, forests, fields)



- Experience different landscapes - such as plains, hills, valleys, rivers, lakes, sea.



- Play in different landscapes - beach, rivers, woodlands etc.



- Show appreciation and sing thanks to the landscapes for letting them play there.



- Learn different vocabulary, e.g. clay, soil, sand, humus, stone, fossil, river, hill, mountain, valley.

**7-12
YEARS**

Experiencing different landscapes



- Observe different soils in the region e.g. in a farm, wetland and forest.



- Sketch the key features that distinguish each landscape such as plains, hills, valleys, rivers, lakes, sea.
- Go for a walk to observe and take photographs of different habitats (e.g. the types of plants which live on the hilltop compared to valley floor, marsh, or next to the river).



- Appreciate different landscapes and their various gifts. In a small group draw a big picture of a certain landscape and illustrate the gifts/benefits of it for nature and/or people. Different groups appreciate different landscapes. Hear from each of the different groups and relate to the principle 'Use and Value Diversity'.



- Research how the local landscapes were formed, and how they are still changing. Children can share this with each other, for example through a guided visualisation in which the children are all lying down with eyes closed, and 'zoom' back in time then slowly visualise how our landscape was formed.
- Find out how the landscape affects what lives in each place (river vs sea vs forest etc).

**7-12
YEARS*****Soil textures and soil tests***

- See, touch and smell different soils with different textures: sand, silt, clay and loam.
- Dig a hole to see the different layers of soil, their colour and depth (topsoil, subsoil, bedrock).
- Observe how different soils affect the plants which grow there - their health as well as the species composition.



- Do a soil touch test. Rub soil between your fingers - does it have big grains like sand or miniscule grains like clay, or is it soapy like silt? Roll soil into a sausage: can it stay like that (indicating clay)? Try with different soils.
- Test soil to find out if it's acidic or alkaline. Use a pH kit and/or do a home test e.g. add 2 spoonfuls of soil to a jar, add vinegar: does it react? If so you have alkaline soil. Add 2 spoonfuls of soil to another jar, add distilled water and baking soda: does it fizz? If so you have acidic soil.



- Sing a song about soil textures (e.g. "There's three different types of mineral in soil", see CiP website).



- Find out about acidity and alkalinity in soil, how it affects plants that grow there, and how plants affect the pH of the soil (e.g. conifers make it more acidic).
- Compare the different properties of sand and clay (e.g. how much water and air it holds, what happens when you stand on it, which holds more nutrients etc.).

**7-12
YEARS*****Indicator species***

- Observe different plants which grow spontaneously locally, investigate how/whether this relates to the soil there.



- Identify common local plants and discuss what they can tell us about the soil conditions (e.g. rushes indicate wet, nettles indicate rich soil).



- Experiment with changing the soil conditions to see if that affects the plants which grow there spontaneously, e.g. in a grassy area with small rushes (*Juncus* species) growing in a straight line may indicate soil compaction. One could dig a section in the row and leave another area untouched. Return months later to see the changes in the plants growing spontaneously there.
-



- Create a story, poem or song about the need for plants to have their own niche (i.e. how different types of plants love being in different places).
-



- Learn that an indicator species is one which, if abundant, healthy and spontaneous (not planted), can tell you something about the local conditions. This may be a plant which tells you whether the soil is compacted, wet, dry, acidic or alkaline.

C. DESIGN

Design is at the heart of permaculture, where the rhythmic beat of the design process enables the flowing and cycling of information, imagination and nourishment. Designing with children is mostly about planning what to do or what to place where, as children can actively participate in designing toys, activities, play, gardens, classrooms, posters, learning and much more. Through this process their cognitive, social and emotional competence can be enhanced. At an early age, children enjoy using a variety of materials in different forms or creating new things. Freely creating from their own imagination encourages the development of confidence in personal expression. By involving children in discussions that stimulate them to think about cause and effect relationships, they can begin to identify problems and think of solutions.

Older children can go through a more complex permaculture design process such as SADIMET (survey, analyse, design, implement, evaluate and tweak), which develops logical thinking, creativity and a systematic scientific approach to problem-solving.

**3-6
YEARS**

Creative Expression



- See examples of other people's creative expression through song, dance, painting, nature art, model-making etc. by hosting events or visiting places (such as museums, outdoor exhibitions etc.).



- Play with designing with sand (in sandboxes or at the beach), clay or other natural materials.
- Experience a dream circle (in which everyone expresses their dream/vision for a project/event).
- Assemble loose parts or creative objects to create own play space.



- Share own ideas, choices and dreams.



- Have a party to celebrate a creation in which they were involved in the design process.
- See their own creative work being appreciated by others.

**3-6
YEARS**

Making choices



- See, taste, smell different options (e.g. different plants for a garden), then choose which ones they want.



- Decide where things go through play (e.g. toy chickens, bees, shed etc.).
- See how their ideas can be included in something which is made (e.g. garden, bridge or tree house).
- Be involved in making choices that are the best for all.



- Appreciate and celebrate the work we have done together (whether making choices, collective artwork etc.).
- Accept that their first preference isn't always chosen, considering all other factors (including other people's preferences, resources, ethics).



- Become familiar with vocabulary relating to choices and design.

**7-12
YEARS**

Surveying the landscape and people



- Experience different microclimates in different weather, noticing the differences with all your senses.
- Observe and recognise well-designed systems in the human environment (e.g. school kitchen, permaculture garden/farm, city squares that have multiple functions etc.).
- Observe the feelings and needs of yourself and others.



- Make a map with overlays of the different microclimates in a garden - sun/shade, wet/dry, wind/shelter.
- Interview, or give out a questionnaire/survey, to children, friends or other people about their needs and wishes for the design.



- List all the different resources you have that could be relevant, e.g. using headings of PASTE (plants, animals, structures, tools and events).



- Appreciate the designs in nature that help natural systems to work well.
- Appreciate the designs in the human environment that help systems to work well.



- Explore the basics of map reading and making (e.g. bird's eye view, scale, north, title, key).
- Become familiar with common natural patterns e.g. branching, spiral, sphere, webs, concentric circles, scatter.

**7-12
YEARS**

Analysing what you found out



- Collate (pull together) information gathered in the survey stage and draw into mindmaps, diagrams, or lists with different headings.
- Play with 'random assembly' using cards (each person has a card with an element drawn on it), moving around the room and putting different elements (identified in your survey) together in unusual ways (using different preposition cards) to see if something new can emerge (e.g. wormery +in+raised bed = worm tower in raised bed).
- Choose two elements, which may be in the design, to dramatise. Children are split into four even-sized groups - inputs and outputs for each element. Each child becomes either an input or output of their element. Dramatise to show how an output from one element can become an input to another element.



- Celebrate the gathering and integration of information.
- Express how each person in the group feels throughout the different stages of the design process.



- Work out your 'limiting factors': list all the things which might limit your design (what problems might you encounter e.g. summer holidays, money, skills).

Designing and deciding



- See a model design made by children or adults using permaculture principles and ethics.



- Create simple permaculture designs using a recognised design process (e.g. SADIMET: survey, analyse, design, implement, evaluate, tweak). Choose a pattern which is most likely to meet your function (e.g. branching pattern for paths). Try using that pattern in your design.
- Make a simple zonal plan of a room, school grounds, or garden (showing frequency of visits/use from zones 0 (home); 1 visited daily; 2 used 2x per week; 3 used weekly; 4 visited less frequently to 5 (wild zone from which nothing is taken), see page 138 for an example.
- Create designs using drawing, model-making, post-its, sandbox, building bricks, ropes etc. on site, or other appropriate method.



- Question what makes things beautiful in order to develop an aesthetic sense.
- When experiencing a challenge, learn to appreciate it by remembering the attitudinal principle 'the problem is the solution' (e.g. find multiple perspectives, reverse the problem).
- Present their own design to friends, families, teachers, community etc in a form of their choice (e.g. drawing, singing, drama, art, video etc).



- Find out about the need for considering microclimate (sector planning) and zones when creating a permaculture design.
- Learn that permaculture design is all about making choices based on the ethics of Earth Care, People Care and Fair Share; and that the permaculture principles can be used to help make these decisions.

**7-12
YEARS*****Implementation: making it happen***

- See an implementation plan and experience how following it can help get things done.



- Be involved in the implementation of their design (e.g. collecting materials, creating a garden, hosting a party, organising an event).



- Meet regularly to celebrate tasks completed.



- Create a colourful implementation plan together using interesting and fun names to show all the information needed to get things done: tasks, timeline, roles, work flows (whether one thing needs to be done before another) and ask who would be passionate about doing them.
- Learn that many hands make light work.

**7-12
YEARS*****Maintenance: looking after your creation***

- Observe other people looking after a system (e.g. a garden), to see 'what is working well' and 'what is taking a lot of work' etc. Where appropriate, consider questions such as 'Where are the tools placed? Are they in the right place?' 'Does it taste good?' 'Do the people look happy?'



- Document a project's maintenance process in order to enable other people to continue your work.
- Use imagination to come up with interesting names for the jobs that have to be done and create costumes for them, e.g. knight is responsible for the tools in the shed.
- Be involved in maintaining a system you designed (e.g. sell harvests to parents in a garden project, visit the local library in a reading project).



- Create own rituals about working together.
 - Show gratitude to people who have helped with the project by inviting them to visit the site and offering a gift of the children's choosing (e.g. herbal tea from the garden).
-



- List the tasks that will need to be done in the long term and create a chart for getting them done (e.g. watering garden, who'll do it in term-time and holidays?).

D. GROWING FOOD

9. GROWING FOOD

Seeing a tiny seed sprout, grow and transform slowly into a plant that offers fruits or vegetables is a fascinating and rewarding experience for children. All of their senses can be engaged in this process: digging in the earth, pouring water, smelling and tasting fruits and vegetables as they are harvested. Observing daily changes in plants develops patience and appreciation of nature; and being directly involved in caring for plants develops their love and respect for nature. Growing food also helps to cultivate an attitude of gratitude for the abundance nature freely offers us, as well as towards those who grow our food. It provides opportunities for celebration and connection with local agricultural history and traditions. The children are also involved in caring for soil through returning food and plant wastes back to the earth as compost - which is another amazing, transformative process to observe over time. Older children are able to understand how plants can feed and support each other in highly diverse systems such as permaculture gardens, food forests, companion planting and aquaculture.

3-6
YEARS

Helping to grow food



- Smell, touch and taste different varieties of vegetables and fruits grown in the garden as well as wild edibles.
- Observe the process of growth of an annual plant from sowing a seed to growing, flowering, fruiting and seeding.
- Touch and compare different seeds, e.g. the seeds of sunflowers, beans, wheat, poppy, apricots.



- Help to grow food plants in a garden and care for them by watering, mulching etc.
- Collect seeds from different plants.
- Use tools safely that are age appropriate e.g. trowels.



- Play games with sorting, grouping or matching seeds, fruits, nuts or vegetables by sizes, colours and shapes.



- Share the abundance of harvests with others, including with birds, animals and compost worms.
- Create a planting ceremony, e.g. with songs, poems or dance, and asking the earth to feed the plant, the sun to shine on it, rain to water it and other wildlife to protect it from being eaten.
- Celebrate harvests with festivals or special meals.



- Find out where food comes from e.g. milk from cows, apples from a tree.
- Compare sizes of vegetables or fruits as they grow.
- Say the names of different plants growing in the garden which you can eat.

**7-12
YEARS**

Growing food the permaculture way



- Observe how different types of plants grow well in different places depending on the available sun, space, water, heat, nutrients etc.
- Observe and identify different types of seeds.
- Observe how a garden inspired by permaculture is different from other styles of gardening.



- Make a new baby plant from a parent plant (taking cuttings).
- Graft one plant onto another (e.g. tomato onto potato).
- Grow plants within a crop rotation (e.g. with lettuce and beetroot grown in one plot one year, next year legumes (beans and peas) and cucurbits (e.g. pumpkin, courgettes, squash, marrows), then brassicas (e.g. broccoli, kale, cabbage, cauliflower, turnip, kohlrabi etc.) and 4th year roots (e.g. carrot, beetroot, celeriac, celery, parsnip) and onions.
- Experience growing perennials and growing annual plants, and discuss the differences and similarities.
- Create a garden, growing food in polycultures, following a permaculture design and implementation plan.
- Grow mushrooms, e.g. on logs, books or sawdust.



- Celebrate harvests with local traditions as well as exploring historical traditions from around the world.
- Care for a plant as it grows and learn to interpret its needs (e.g. Is it happy? Does it need water? Why is a leaf yellow? What can make it happier?).
- Build a positive relationship with 'weeds' by collecting and pressing/drying them to make a piece of art, for example making a beautiful salad to share, decorating a greeting card, creating ID cards or making an exhibition.



- Find out about the history of the foods and plants that were traditionally cultivated in the local community.
- Select appropriate plant species for the location, taking into account microclimate, soil type, soil pH, etc.
- Learn when to harvest different types of produce from the garden.

**3-6
YEARS**

Caring for soil



- See that food scraps placed in the top of the wormery/compost bin gradually become compost (which looks like black soil).
- Touch and smell healthy, fertile soil.



- Collect materials for the compost heap/wormery and feed it.
- Help collecting home-made compost and placing it around plants to feed them.



- Sing a song about compost, such as the one on the CiP website.
- Listen to stories about the soil and the communities of minibeasts that live in it.



- Find out that compost is good for plants and helps them grow.
- Discover that food scraps can gradually turn to compost.
- Learn that it is good to cover soil with mulch, to feed the worms and keep the soil moist.

Caring for soil



- See, smell and feel healthy soil, and compare to degraded soil (e.g. soil from a lawn or intensively farmed field).
- See the layers of a compost bin or worm tower (e.g. through a transparent side) and observe how organic material transforms into compost.



- Identify creatures in the compost (the children could create cards with pictures, names and explanations of the roles of that creature).
- Do a scientific experiment comparing different ways of making compost: e.g. under water vs air, with all 'greens' together vs with 'greens' and 'browns' in layers, in sun vs shade, with added worms vs without, adding effective micro-organisms, small vs large container, hot composting, wormery etc. Survey the experiment weekly for 2+ months. Compare smell, colour, flies, decomposition rate etc.
- Use green manures to improve soil between crops.



- Have a compost party to celebrate the output from your compost.
- Role play soil. Each person takes on a role of an element of the soil (e.g. clay/sand/silt particles, water, air, organic matter, plant roots, fungus, bacteria), then dramatise how those elements interact in different soils (e.g. compact, dry, wet, rich soil). Compacted soil has no air. At the end create a perfect mixture for growing which is 25% air, 25% water, 10% organic matter and 40% mineral.



- Find out that "weeds" are indicators of soil condition and can repair damaged soil (as they can establish quickly, protect and restore bare soil).
- Discuss the importance of fertile soil and different ways of providing it (e.g. fertilisers, manure, nitrogen-fixing plants, compost).
- Research why people dig, what the effects of digging are and how we can reduce digging by using different plants, not stepping on soil, mulching etc.

**3-6
YEARS*****Food forests***

- Be in a food forest with different plants growing together, notice the smells, sounds and textures.
- Be in a woodland with different plants growing together, notice the smells, sounds and textures.



- Transplant different plants (e.g. fruit trees, bushes, herbs, ground cover) into the food forest following a design.
- Eat food straight from a food forest.
- Spot some plants in a food forest, perhaps using ID/flash cards.
- Make non-food creations from a food forest (e.g. tie dye cloth, nature loom, beeswax candles).



- Draw gifts of the food forest in different seasons.
- Listen to a story and admire pictures about a child receiving inspiration and support to create a food forest e.g. in 'Mira-belle's Forest Garden' by Curic and Kinga (2017).
- Share the abundance of the food forest in a picnic with hand-made dolls (made from products of a food forest).



- Become familiar with new vocabulary such as food forest, edible, and poisonous.
- Say the names of different plants in the food forest.

**7-12
YEARS*****Food forests***

- Observe the different layers in the food forest and compare with the layers in a forest (roots, ground cover, herbs, bushes, small tree, big tree, climbers, lichens).



- Play a game (e.g. with cards) matching the needs with the outputs for different elements in a food forest.
- Be involved in designing and planting a food forest.
- Maintain a food forest through removing tree guards, pruning, chopping and dropping 'weeds'.



- Value diversity in the food forest through story or song.
- Visualise walking through a food forest and foraging different types of plants, herbs, honey, roots and more, and collect into a beautiful basket to share with other people in the local community.
- Sit quietly in a food forest, listening, drawing, writing poems etc.



- Learn what a food forest is and how it can meet our food needs.
- Discuss each of the permaculture principles to see how many you can find in a food forest.
- Say the names and discuss the uses of plants in the food forest.

**3-6
YEARS**

Animals in permaculture



- See a natural beekeeping system.
- Watch cows, sheep or goats being milked by hand, and have a try if interested.
- Notice what wild animals are eating and what their homes look like.



- Build homes for the wild animals in a garden (e.g. leaf pile, log pile, bird house).
- Help looking after animals in a permaculture way (e.g. fish, chickens, worms).
- Gather some animal products and use them for art and craft (e.g. feathers, honeycomb, painting eggs).



- Respect the needs of animals (e.g. not touching or carrying them if they don't like it).
- Saying/singing thank you after spending time with animals or visiting them.



- Discuss what makes animals happy and how and what to share with them.

Animals in permaculture



- Observe a permaculture way of keeping fish, such as in a naturally-styled pond which fits with its environment (for more information see Sepp Holzer's work e.g. 2011).
- Visit a farm where domesticated animals roam freely. See how their houses are designed for winter and compare to regular farms (e.g. sheep, cows, goats, ducks, chickens, guinea pigs).
- Experience ways to integrate animals in the farm/garden in order to perform their ecosystem function, e.g. let chickens go into a field after the potato harvest and allow them to turn the soil, add manure and eat pests.
- Notice what wild animals are eating, and what their homes look like.



- Create habitat for wild animals in a garden (e.g. wildlife pond, wildflower meadow).
- Look after animals in line with the permaculture ethics (e.g. fish, chickens, worms, birds).
- Create something from a product of an animal found in nature or a garden (e.g. candles, brushes, feather pens).



- Give thanks for all the things that animals do for us and other living beings.
- Share feelings and thoughts about the ethics of keeping animals in a garden.



- Learn what bees and other insects do for us and how we can look after them.
- Research the way indigenous people (e.g. Sami or native Americans) used the whole of an animal (e.g. buffalo) to meet many of their needs (e.g. clothes, housing, footwear, music, boat, food). Explore how local people's traditional practices enabled them to 'Produce no waste' and 'Use and value renewable resources'.
- Discuss why some people are vegetarians and vegans, and what the alternatives to using animals within the garden and food chain might be.

Companion plants and other nutrient givers



- Look at a companion planting chart.



- Decide which companion plants and nutrient-givers (nitrogen fixers and dynamic accumulators) to include in the garden and where, then plant them together (e.g. carrots and onions; maize, beans & squash).
- Play a matching game to learn which plants help each other best.
- Coppice nutrient-givers (nitrogen-fixers and dynamic accumulators) and use as a mulch on the rest of the garden (e.g. comfrey).



- Celebrate the harvests from growing plants in polycultures, and compare with those from a monoculture.
- Hear a story about companion planting with plants giving nutrients to other plants.



- Find out why some plants have nitrogen fixing nodules.
- Discuss why some people grow diverse plants together in polycultures.

CHAPTER V

EXAMPLE SESSION PLANS

This chapter exemplifies how ‘Inspirations for activities’ can be developed into a session plan, which is a composite of ‘sowing’ the seed of inspiration, ‘growing’ and ‘harvesting’. The aim is to show how a session can embrace the CiP pedagogy, revealing how the ‘eyes, hand, heart and head’ of holistic learning can all be engaged. These full descriptions also highlight the links between the school and permaculture curricula, state the setting and season to which they are appropriate and explain the relation to the permaculture ethics and principles. These session plans offer examples of ways to embed sustainable practice into education.

Although a full description of the session is provided, if the children want to lead it in a different direction, that should be supported and encouraged. Children may share ideas or ‘seeds of inspiration’ for ways to change the session or things they could be interested in doing in the future which is why there is a space called ‘Inspirations’ provided for educators to note them.

The phrase ‘session plan’ was used to emphasise the importance of following the interests of the children, with an open-endedness which encourages the empowerment of the child. In contrast, the phrase ‘lesson plan’ conveys the idea of a fixed timetable, with a teacher’s detailed description of the course of instruction and a focus on what the students will accomplish that day. By using the term session plan, the aim is to change the discourse in education and create a more flexible path for learning.

The session plans were trialled by educators from different climate zones and educational settings, then the feedback from children and educators was integrated. Thus they can be relevant in many different parts of the world and provide a wide variety of

ways to engage children in permaculture. All six themes of the CiP curriculum, from 'Introducing permaculture' to 'Social permaculture', are covered by these session plans. Educators are invited to enjoy, share and adapt these session plans to their settings and circumstances and be inspired by them to create their own, based on the needs and interests of the children.

V.1 MEET THE FOREST

By Gaye Amus

1. AGE

4-7 years

2. GROUP SIZE

3-12 children

3. DURATION

3 hours including free play.

4. BRIEF OVERVIEW

Children explore the forest and find out about the permaculture ethics of Earth Care, People Care and Fair Share and how they apply to being in a woodland. Depending on the children's age group and previous experience, the educator can choose to introduce only one ethic per visit.



5. CURRICULUM THEME

Theme		Topic	3-6 years	7-12 years
A	INTRODUCING PERMACULTURE	1. Permaculture ethics and principles	✓	
		2. Connections		
B	LIVING NATURE	3. Soil and stone	✓	
		4. Water	✓	
		5. Plants and trees	✓	
		6. The animal, fungus and bacteria kingdoms	✓	
		7. Air	✓	
C	DESIGN	8. Designing		
D	GROWING FOOD	9. Growing food		
		10. Preparing food		
E	BUILT ENVIRONMENT AND RESOURCE USE	11. Buildings		
		12. Using nature's gifts wisely	✓	
F	SOCIAL PERMACULTURE	13. My body, heart and mind	✓	
		14. My community		
		15. Our human family		

6. SCHOOL THEME

Mathematics / Language / Science

Social Sciences / Arts (Music...) / Health and wellbeing

7. SEASON

European Spring / European Summer

European Autumn / European Winter

8. SETTING

Forest - This session can be adapted to suit all kinds of natural environments.

9. HOLISTIC PLANNING



- See, touch and smell different parts of the forest, and the forest as a whole. What will the children observe?
- Feel the forest floor.



- Play with mud, soil and/or water.
- Discover the forest as a natural playground.



- Show appreciation of nature by connecting with and caring for living things.
- Sing a farewell song before leaving the forest.

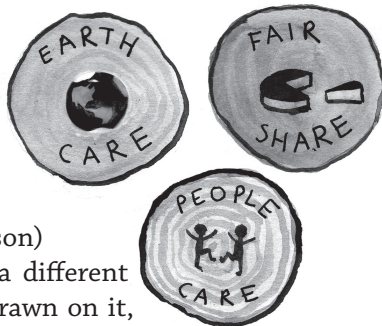


- Find out what can be done in the forest whilst taking care of the environment.

10. PREPARATION OF MATERIALS AND RESOURCES

a) Required Materials and Tools:

- One mat per child - for them to sit on
- Tarp for shelter in case of rain
- Magnifying glasses (several)
- A snack to share, preferably harvested from the garden (e.g. carrots depending on the season)
- Three 'wood cookies', each with a different permaculture ethic written and drawn on it, as illustrated.



b) How to prepare space and/or people:

Before taking children to the woods, ensure that the space is clear from any litter and there aren't any big fallen branches hanging in the trees. A tarp can be put up in advance in case of rain if needed. A space which has clear boundaries can be picked or boundaries may be clarified by leaving a natural marker.

11. SESSION DESCRIPTION



SOWING

This will be the first time that the children go to the forest as a group. Before they leave the nursery/school grounds for a walk to the forest, the children will be invited to form a circle, greet each other and count how many of them there are. The educator will share that this number will be the same before they leave the forest. The children can take their time while walking to the woodlands and pause to observe interesting things they find on their way, if they like. The educator shall guide the children to the place in the woods where they can sit together in a circle, on their mats.



GROWING

The children will be shown the Fair Share ethic cookie whilst they share the snack fairly.

After snack time, they will be invited to pretend to be a centipede with the educator being the head of the centipede, and all the children are the many legs. The centipede walks around the boundaries of the area of the forest in which they can play. When the children arrive back to the circle they will be shown the Earth Care cookie and the educator can ask a question such as "Whilst playing, if you would like to play with leaves or branches, how do you think you could make sure that no trees or other plants get hurt?" Listen to the children's ideas one by one, whilst the second educator notes them down, so they can be referred back to later. It could be interesting to see how their ideas develop as they make more visits to the forest.

The last cookie, People Care, will be introduced through the game "1-2-3 where are you?" which is played like this:

The children find places to hide within the boundaries whilst one of the educators waits with their eyes shut counting. Meanwhile the other educator is hiding and also keeping an eye on the children. After hiding time has ended, the educator shouts '1,2,3 where are you?' and the hidiers reply '1,2,3 here I am!'. The educator can then

call '1,2,3 reveal yourself!', to which the children respond by coming out of hiding and calling back '1,2,3 here I am!'.

After playing the game a few times, call them back together. Share with the children that whilst they are playing freely within the boundaries, the game can continue at any time, so we can all look after each other.

The children can now spend time playing freely in the forest. The educator will observe, interact and if it might be useful, offer magnifying glasses if the children would like to explore in more detail.



HARVESTING

Before it is time to leave, invite everybody to stand in a circle and take turns to tell the group what they liked about the session and/or how they feel. You may also sing a farewell song to thank each other and the forest for the visit. As a group, count all the children to make sure that everybody is together and check that the area played in is left 'as it was or a little bit better'.

12. PERMACULTURE ETHICS AND PRINCIPLES

Children see, feel and experience the three ethics throughout the session. Fair Share is experienced by the equal sharing of food, and Earth Care by how one treats the forest, leaving no trace behind and by caring for the plants and other living beings. People Care is experienced by the creation of a safe environment for play and exploration as well as taking care of each other. Additionally, inviting feedback and sharing feelings helps ensure People Care.

- **Produce no waste:** In the forest, care is taken not to produce waste and no litter is left behind.
- **Observe and interact:** The educator observes the children and then interacts.
- **Creatively use and respond to change:** In the forest the children and educators can be in situations (e.g. change of weather, conflict etc.) where they need to creatively use and respond to any changes which arise.
- **Work with nature (rather than against her):** Being in the

forest requires collaboration with nature and being aware of our actions to sustain the harmony there.

- **Everything gardens (or has an effect on its environment):**
The forest affects the children, helping them to flourish with fresh air, space and stimuli.

13. INSPIRATION

14. IDEAS FOR EXTENDING THE LEARNING AND EXPERIENCES

On every visit to the forest, how the children spend their time there could be linked to an ethic, for instance how we treat insects. Different aspects of each ethic may appear gradually over a long course of time, as the children continue to explore the woodlands. Based on the observations and interests of the children, some of the activities or games described above can be repeated in subsequent visits to the forest. Inspirations from the children themselves will also provide educators with many ideas.

The ethics cookies could hang up on a tree as a reminder that whilst we are here playing we take care of the Earth and people and share fairly. Then if the children feel that they have done something they would like to tell others, they can point to the wood cookie and talk about it, e.g. 'I did People Care today when I looked after my friend'.

V.2 MIND THE FOOD

By Tereza Velehradská and Valentina Cifarelli

1. AGE

10+ years

2. GROUP SIZE

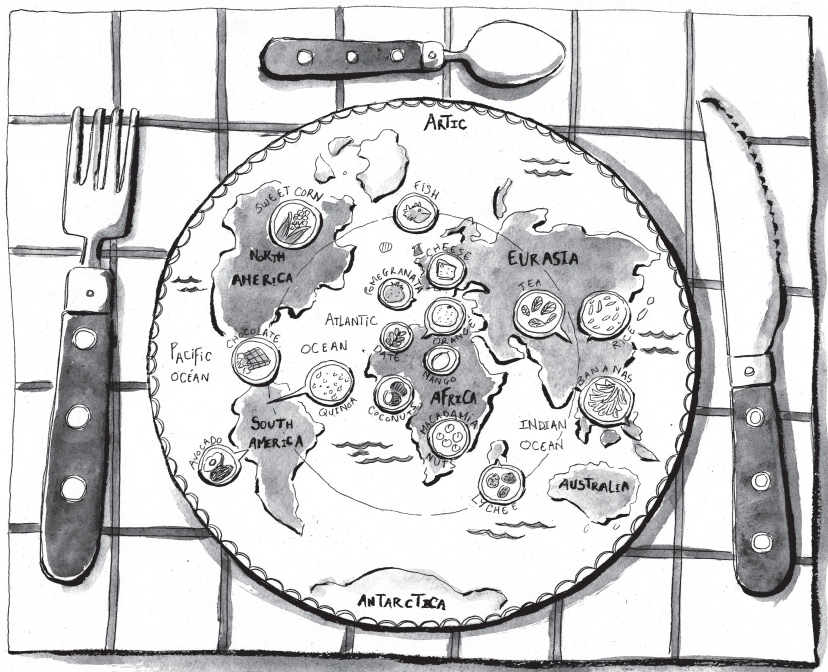
2-14 children per adult.

3. DURATION

3+ hours

4. BRIEF OVERVIEW

‘Mind the food’ aims to enable children to explore the global food network through choosing a recipe, going shopping, finding out where food comes from and discussing ethical choices about food. In groups they cooperate and work together as a team whilst decision-making, cooking and sharing their food. Children can discover surprising relationships that food creates between countries and people all over the globe.



5. CURRICULUM THEME

Theme		Topic	3-6 years	7-12 years
A	INTRODUCING PERMACULTURE	1. Permaculture ethics and principles		✓
		2. Connections		
B	LIVING NATURE	3. Soil and stone		
		4. Water		
		5. Plants and trees		
		6. The animal, fungus and bacteria kingdoms		
		7. Air		
C	DESIGN	8. Designing		
D	GROWING FOOD	9. Growing food		
		10. Preparing food		✓
E	BUILT ENVIRONMENT AND RESOURCE USE	11. Buildings		
		12. Using nature's gifts wisely		✓
F	SOCIAL PERMACULTURE	13. My body, heart and mind		
		14. My community		✓
		15. Our human family		✓

6. SCHOOL THEME

Mathematics / Language / Science (biology, chemistry, physics)

Social Sciences / Home economics (cooking, sewing etc) /

Health and wellbeing

7. SEASON

Any

8. SETTING

Indoors and local shop

Optional: garden or hedgerow

9. HOLISTIC PLANNING



- Notice the different ingredients in food
- Taste different foods
- Experience shopping



- Going to a shop to buy food which meets the permaculture ethics of Earth Care, People Care and Fair Share.
- Harvest and prepare a meal or snack.



- Consider the ethics in relation to where food comes from.
- Connect to the local people, e.g. the shopkeepers, ask how they are, wishing them a good day.



- Understand the importance of using as few non-renewable resources as possible, including oil.
- Compare the environmental impact between local, fresh, organic food and industrial food.
- Discuss which goods are the best examples of Earth Care, People Care and Fair Share (the ones with the least packaging, that travelled the shortest distance, chemical-free etc.)

10. PREPARATION OF MATERIALS AND RESOURCES

a) Required Materials and Tools:

Each team of 3-5 children will require:

- 1 worksheet (see the appendix)
- money (enough to purchase their ingredients for a snack/meal)
- 1 pencil
- 1 cloth shopping bag
- A choice of 2-4 recipes which they can prepare/adapt

In addition, the children will require a kitchen (or campfire) with utensils and facilities relevant to the recipe they select.

b) How to prepare space and/or people:

Speak to the shopkeeper(s) about a possible visit.

Ensure that there are sufficient adults for the trip to the shop: one per group if possible. Agree in advance that they are there to help if needed rather than give advice.

Make sure that all children:

- have some previous knowledge about the permaculture ethics.
- have the required permissions.

11. SESSION DESCRIPTION



SOWING

The educator suggests that children can work together in a group to choose a recipe then adapt it to their ingredients, utensils and number of children/dietary requirements in the group. The aim is to prepare a meal or snack which meets the permaculture ethics of People Care, Earth Care and Fair Share. Children and educator(s) chat about how best to do this, perhaps they can do it by foraging local wild food, harvesting food grown in a garden and/or buying in a shop. When purchasing from a shop, the food should be as local and seasonal as possible, and there will be limited time and money for this. If it is possible to get food from a source other than a shop, find a strategy to achieve that depending on the local resources. Educators can leave it open and child-led. If needed, break the group into smaller teams of around 3-5 children.





GROWING

Even when children choose to harvest food from a garden or local natural environment (through foraging), normally a meal will require some other ingredients from a shop. In order to do this part of the exercise, each team starts with the same materials: the same amount of money, a shopping bag, worksheet and pencil. The worksheet in the appendix below helps children to investigate more about where the food comes from. Give out the worksheet, money, pencil and bag to each group explaining how much time and money they have. If possible, teams can choose different strategies and go to different places or all teams can go into the same shop. It is preferable, if possible, to have one adult per group to accompany them. Revise the social norms when visiting a shop, decide where to meet after the activity and make an agreement about staying together with the group.



HARVESTING

Once the teams return, they present to the rest of the group what they chose and how much money they used. Then the children can discuss which items are the best examples of Earth Care, People Care and Fair Share. In Earth Care, children can be encouraged to consider questions such as ‘Which ones used the least oil?’ because oil is used in packaging, travelling, fertilisers, pesticides, tractors and much more. In People Care, the discussion could be around the effects of the product on the growers as well as the consumers. The children could rank the items for the different ethics. What do the children feel are their most interesting findings?

GROWING

The children work in the same groups to prepare a meal or snack from the ingredients they have bought, harvested and/or foraged.

HARVESTING

The children eat the meal or snack together and celebrate the food and their learning.

12. PERMACULTURE ETHICS AND PRINCIPLES

- **Earth Care:** Choices related to food affect the environment. Children can explore how to care for the Earth through their food choices.
- **People Care:** Children discuss how each food meets the ethic of People Care. If the differences in costs creates curiosity, they may discuss how local, organic and/or fairtrade food is good for people - both producers and consumers.
- **Fair Share:** Children discuss how each food relates to Fair Share, decisions on what we eat affect people and other living beings. Children can ensure that each member of the group have a fair share of the food that they eat.
- **Observe and interact:** This activity guides children to observing, thinking and planning before implementing. Also, paying close attention to labels and food packaging is important in order to complete the worksheet. Children can also observe the different quality of food that is coming from different sources.
- **Use and value renewable resources and services:** This permaculture principle encourages using renewable resources and services so that systems can continue to work well. It can be inspiring and interesting for children to think about where their food comes from and how much oil (a non-renewable resource) was used to transport their food.
- **Produce no waste:** When discussing Earth Care, children may reflect on how much waste is produced to get our food on the table and whether these resources are returned back to the nutrient cycle, for example with food packaging.
- **Everything gardens:** Bringing an awareness that people's choices can influence nature in many different ways including other people, even on the other side of the planet.

13. INSPIRATION

14. IDEAS FOR EXTENDING THE LEARNING AND EXPERIENCES

If the children show interest, future sessions could include making a map of where all their food came from, learning more about Fairtrade, organic, ecological footprints, oil and much more.

Children can discover surprising relationships that food creates between countries all over the globe, and thus see how the food they eat can create a map of resources, introducing the concepts of interdependence and globalisation through the geography of food.

APPENDIX:

The worksheet can look like this:

Your quest is:

1) To buy all the things that you need to follow the recipe which your team has selected and your teacher has approved. You can spend **xy** money, but you do not need to use everything you buy. In addition to the ingredients for the recipe, you could buy something to drink – it is up to you what you choose.

ITEM WE BOUGHT	THE COUNTRY IT COMES FROM	REASONS FOR CHOICE

2) In the fruit and vegetable section, find out which fruit or vegetable has travelled the furthest and which has travelled the least. Write the type of fruit and the country it has come from.

THE LONGEST DISTANCE:

THE SHORTEST DISTANCE:

3) In the dairy section, do any products have packaging made from recycled materials?

PRODUCT:.....

TYPE OF PACKAGING:

4) In the sweets section, which product's packaging is the best example of Earth Care, and which is the worst example of Earth Care (in your opinion)?

THE BEST PACKAGING:..... THE WORST PACKAGING:.....

WHY?:..... WHY?:.....

V.3 BIOMIMICRY - IMITATION OF COLOURS

By Tereza Velehradská. Inspired by Gaye Amus and Lenka Babáčková

1. AGE

5+ years

2. GROUP SIZE

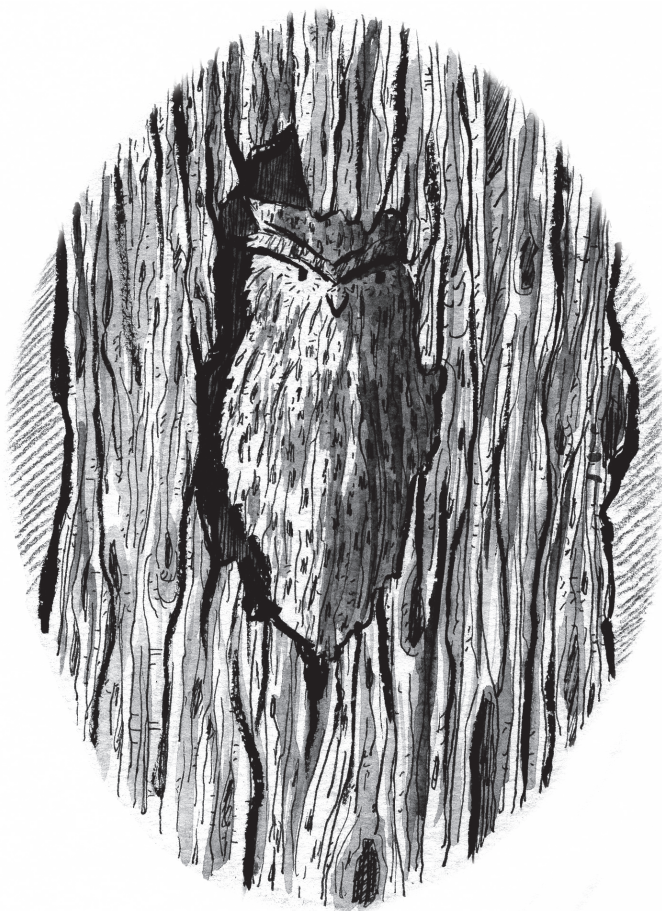
2-14 children per adult.

3. DURATION

45 - 90 minutes

4. BRIEF OVERVIEW

Children find out about animals who are well adapted to their environment and try to camouflage each others' hands using colour. It can be used as a stand alone activity, or as a bridge to more complex activities about consistency of shapes, materials etc.



5. CURRICULUM THEME

Theme		Topic	3-6 years	7-12 years
A	INTRODUCING PERMACULTURE	1. Permaculture ethics and principles	✓	✓
		2. Connections		
B	LIVING NATURE	3. Soil and stone		
		4. Water		
		5. Plants and trees	✓	✓
		6. The animal, fungus and bacteria kingdoms	✓	✓
		7. Air		
C	DESIGN	8. Designing		
D	GROWING FOOD	9. Growing food		
		10. Preparing food		
E	BUILT ENVIRONMENT AND RESOURCE USE	11. Buildings	✓	✓
		12. Using nature's gifts wisely	✓	✓
F	SOCIAL PERMACULTURE	13. My body, heart and mind		
		14. My community		
		15. Our human family		

6. SCHOOL THEME

Science (biology, chemistry, physics) / Art / Language

Social Sciences / Maths

7. SEASON

European Spring / European Summer / European Autumn

8. SETTING

Forest / Garden

9. HOLISTIC PLANNING



- Observe animals' and plants' colours in nature.



- Painting each others' hands to make them in harmony with the environment and help increase development of their aesthetic sense.



- Appreciate animals and be inspired by their shelters.
- Connect with members in the group/friends while painting each other's hands

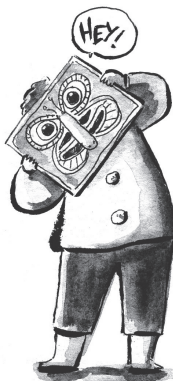


- Find out about camouflage and biomimicry.

10. PREPARATION OF MATERIALS AND RESOURCES

a) Required Materials and Tools:

- Pictures of around 3 animals which have camouflage colours which your particular group of children may know, for example a butterfly (with wings that look like the eyes of a mammal), or fawn (which is the colours of the undergrowth). You can print the photos and put into a transparent file (polypocket), or you could use a book with big pictures.
- Starch, water and natural food colouring, or finger paint (of colours to match the patterned cloth), pots, water and brushes for painting.
- Water and environmentally friendly soap (or suchlike) for cleaning hands at the end.
- A feather (preferably from a species that lives locally, you can often find them lying around).
- If desired, a colourful patterned cloth which is large enough for all the children to sit around, or several smaller patterned cloths depending on the group.



b) How to prepare space and/or people:

Visit the site in advance to do a risk-benefit assessment and look for examples of birds, insects and other animals and their shelters.

11. SESSION DESCRIPTION



SOWING

Educator(s) and children go to the site (it is possible to do this activity in a forest, garden, park or a combination of these).

The group stand in a circle and the educator takes a feather and says: “I found an interesting thing from my friend the other day, she asked me: *Do you know why the feathers of birds in our woods are mostly brown or black?* I made some guesses, would you like to guess too?”

It is interesting to hear the children’s ideas, perhaps another educator can take notes and see if new activities or ideas come out about birds, shelters or any other interesting things.

If the children make guesses or share something they already know such as hiding, not being seen or avoiding being eaten, you can continue to say “Yes, that’s what I found out too!” and share the joy. The word “camouflage” can be mentioned as well.



GROWING

The educator can ask if they can think of any other animals, insects or their shelters, that might be hiding like that in the woods. Children can try to find some camouflaged animals or their shelters around the site.

SOWING

For older children, the educator can show pictures of animals which have camouflage colours. The educator can explain that biomimicry is when people copy something that they see in nature, for example using colours that camouflage them. The children might want to discuss this.

GROWING

The group can prepare colours from starch, water and food colouring, plant dyes from the garden, mud or other natural materials in the woods.

Invite the children in pairs to help camouflage each other's hands on tree trunks, moss or any other surface so well that their hands are barely visible.

Instead of natural surfaces, children could camouflage their hands against a colourful patterned cloth.



HARVESTING

Invite the children to share their 'work of art' by walking to see their hands on their chosen surface. It will be useful to harvest from the children what they experienced and/or learnt from this activity.

12. PERMACULTURE ETHICS AND PRINCIPLES

- **Earth Care:** Children are connecting to animals' need to camouflage themselves. Using natural paints and colouring helps to take care of the Earth.
- **People Care:** Children paint each others' hands as a way of looking after each other. Giving the children an opportunity to learn and to share what they have learnt is also an example of People Care.
- **Observe and interact:** Children need to observe the patterns to duplicate them on each others' hands.
- **Integrate rather than segregate:** Exploring how some plants, animals or shelters are designed to really look like they are fully integrated into their environment.
- **Use and value diversity:** Finding out that animals use many different environments for hiding and that a more diverse environment can offer more shelters for animals and also more resources for people.

- **Creatively use and respond to change:** Discovering that flexibility and working with nature in using colours can bring good results.
- **Work with nature (rather than against it):** Children discover that for animals it is an advantage to look like the environment or to have shelter like it. Children learn how to create something in accordance with the environment (in colour, shape etc).

13. INSPIRATION

14. IDEAS FOR EXTENDING THE LEARNING AND EXPERIENCES

To explore the topic of biomimicry further, older children could copy a pattern design from nature into something they build. They could consider what patterns are present in nature, what functions these patterns may have and whether humans have mimicked this pattern in a human design (e.g. sticky willow (galium aparine)'s hooks have been copied to make velcro).

V.4 TREASURE MAP

By Lusi Alderslowe

1. AGE

8-11 years

2. GROUP SIZE

4-12 children per adult.

3. DURATION

2 hours plus free play

4. BRIEF OVERVIEW

In this session children explore a sense of direction, maps, and how to make them. This will help to familiarise them with creating and using maps before they design an outdoor space. It involves storytelling, drawing a map together, then using the map to look for treasure.



5. CURRICULUM THEME

Theme		Topic	3-6 years	7-12 years
A	INTRODUCING PERMACULTURE	1. Permaculture ethics and principles		✓
		2. Connections		
B	LIVING NATURE	3. Soil and stone		
		4. Water		
		5. Plants and trees		
		6. The animal, fungus and bacteria kingdoms		
		7. Air		
C	DESIGN	8. Designing		✓
D	GROWING FOOD	9. Growing food		
		10. Preparing food		
E	BUILT ENVIRONMENT AND RESOURCE USE	11. Buildings		
		12. Using nature's gifts wisely		
F	SOCIAL PERMACULTURE	13. My body, heart and mind		
		14. My community		
		15. Our human family		

6. SCHOOL THEME

The school which this session plan was created for, Gatehouse School in Scotland, has a part of the school rationale 'using maps' for which this session was designed. It also relates to:

Mathematics / Language / Science

Social sciences (geography) / Physical Education

7. SEASON

Any

8. SETTING

Forest / Garden

9. HOLISTIC PLANNING



- Observe a biodiverse native woodland.
- See a map being created.



- Play in a biodiverse native woodland.
- Draw and use a map.



- Spend time connecting to the woodland, awakening the sense of mystery and adventure.
- Listen to a story and share own experiences about getting lost.



- Find out about the basics of map-reading and making - bird's-eye view, scale, North, title, key.
- Share what they know about mapping.

10. PREPARATION OF MATERIALS AND RESOURCES

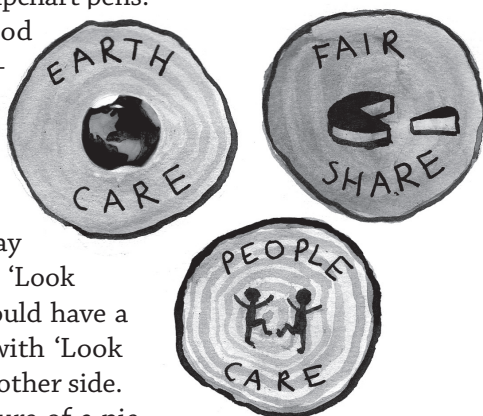
a) Required Materials and Tools:

- Treasure in different coloured bags (e.g. red, yellow, blue, purple). The number of bags depends on the number of children and group size, 2-6 children per bag. It is best if each bag has the same contents, this could be fruit to share or natural items, such as a mixture of shiny pebbles, larch cones and leaves.
- Hide the treasure bags in various parts of the site, and keep a note of where you hid each one by drawing a quick sketch map of the site for yourself and marking 'X' in the appropriate coloured pen. "Hide" the treasure in a very obvious place within your boundaries which you can easily mark on the rough map and give simple instructions to find. An example with older children is "Go to the junction of the two paths, then go 10 paces North." Note down the location of each bag (including the number of paces) on the sketch map, as a reminder to yourself.



For younger children, use larger bags, and 'hide' them in a very obvious place directly at large landscape features (rather than a number of paces away).

- 1 or 2 big pieces of paper (e.g. size A2) with board (to lean the paper on), pencil, coloured flipchart pens.
- 3 ethics wood cookies (wood cookies with the 3 permaculture ethics drawn and written on them). For example, Earth Care could have a picture of a tree, and on the other side is a different way of saying the same ethic e.g. 'Look after nature'. People Care could have a picture of dancing people with 'Look after others and self' on the other side. Fair share could have a picture of a pie with a slice taken out and 'Share the surplus' written on the other side.
- Safety equipment as required in your situation, such as: a charged mobile phone, risk-benefit assessments, emergency procedure, medical forms, first aid kit etc.
- If it is likely to rain, it may be useful to bring a tarpaulin or two depending on how the groups are split.
- If the children are not already familiar with the compass directions, a large wood cookie (15-30cm diameter) can be decorated with N, S, E, W in the appropriate directions and kept in the centre for reference.
- A large-scale map of the local area, approximately 1 map per 6 children.



How to prepare space and/or people:

A biodiverse native woodland with a clear area for seating. Check the area in advance to remove dangerous litter (e.g. syringes) and do a risk-benefit assessment. Participants to bring water, healthy food and appropriate clothing as necessary. Make sure that the

children are clear on the boundaries of the site before this session starts, by walking the boundaries and/or playing the game “1,2,3 where are you?” (probably in a previous session). There is a description of how to play this game in the session plan ‘Meet the forest’.

11. SESSION DESCRIPTION

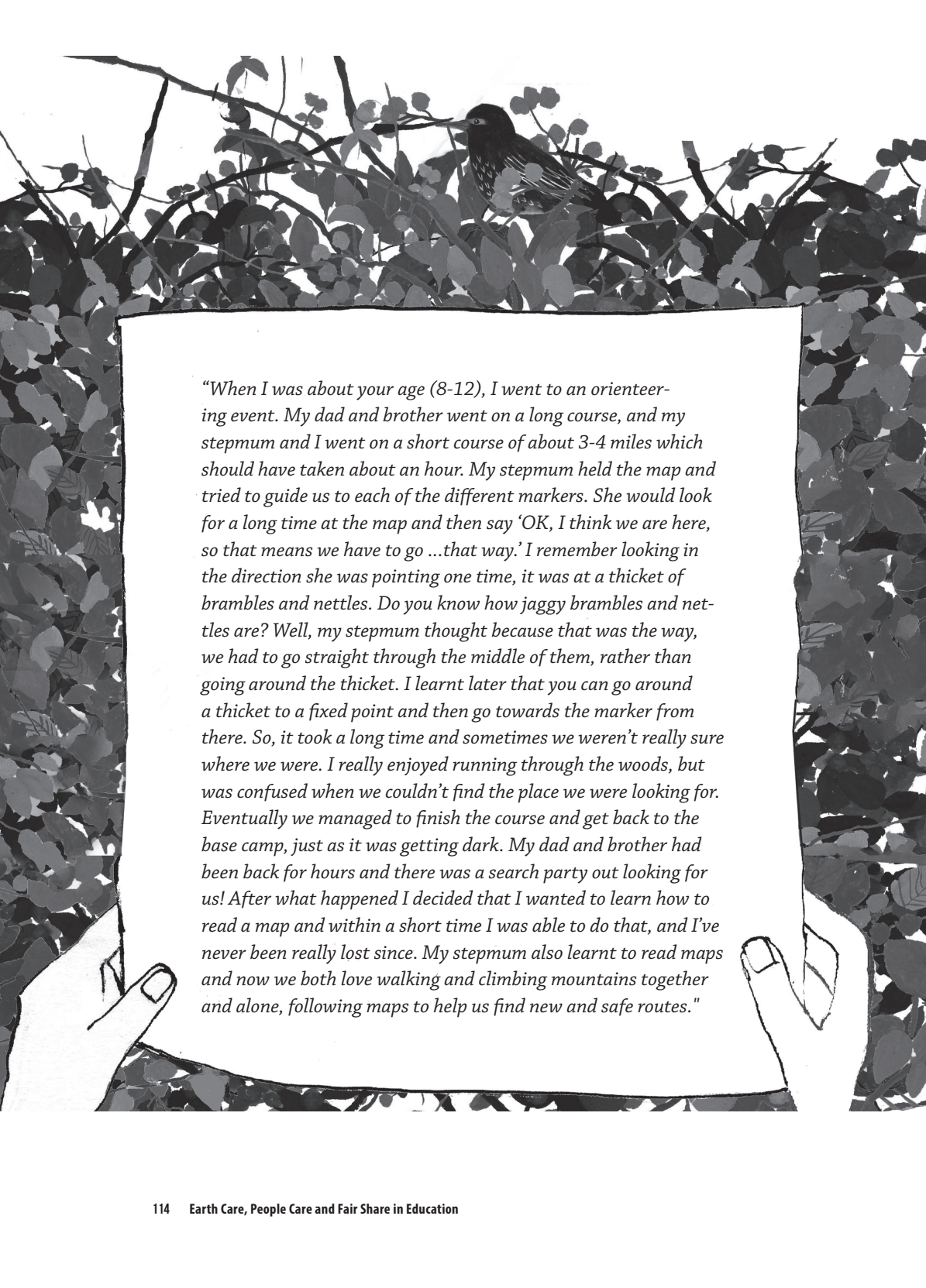


SOWING

- Start the session with a short welcome and appreciation of the beautiful place and wonderful people we are with.
- Permaculture ethics: Once you are sitting in a circle, bring out the 3 ethics wood cookies.
- Take each ethic in turn and ask the children what this might mean in terms of how we will be with each other today. For example, Earth care could be ‘not hurting living plants or animals’, People Care could be ‘we won’t hurt each other, and will respect how others feel’ and Fair Share could be ‘we will share fairly the things we find, and make sure everyone is given the same amount of time to talk’.
- Story.

It is good, if possible, to use a personal story (from the educator’s own childhood) as this will add relevance and connection. If it is difficult to think of a relevant story of your own, you could use or adapt the one described overleaf, which is a true story from Lusi Alderslowe’s childhood. After telling this story you could ask the children:

- “Have any of you been lost?” Listen to some of their stories about being lost.
- “How could we stop ourselves from getting lost?” Welcome any suggestions which can help and invite children to clarify why their suggestions are useful (e.g. ‘Why is a map useful?’). Be aware that the conversation may move in a different direction to expectations and you can note any ideas that come up for future sessions.



"When I was about your age (8-12), I went to an orienteering event. My dad and brother went on a long course, and my stepmum and I went on a short course of about 3-4 miles which should have taken about an hour. My stepmum held the map and tried to guide us to each of the different markers. She would look for a long time at the map and then say 'OK, I think we are here, so that means we have to go ...that way.' I remember looking in the direction she was pointing one time, it was at a thicket of brambles and nettles. Do you know how jaggy brambles and nettles are? Well, my stepmum thought because that was the way, we had to go straight through the middle of them, rather than going around the thicket. I learnt later that you can go around a thicket to a fixed point and then go towards the marker from there. So, it took a long time and sometimes we weren't really sure where we were. I really enjoyed running through the woods, but was confused when we couldn't find the place we were looking for. Eventually we managed to finish the course and get back to the base camp, just as it was getting dark. My dad and brother had been back for hours and there was a search party out looking for us! After what happened I decided that I wanted to learn how to read a map and within a short time I was able to do that, and I've never been really lost since. My stepmum also learnt to read maps and now we both love walking and climbing mountains together and alone, following maps to help us find new and safe routes."



GROWING

- Ask the children to explain what a map is and how it might be useful to help them find the treasure. You may wish to show the children a large scale map of the area to ask them what they notice about it and hear what they already know or are interested in (this may include the different features of a map: key, scale, colours, rivers, houses etc). It may be necessary to split the children into smaller groups to enable each of them to be heard and to interact with a map.



- The educator can get a large flipchart paper on a board. Add a North arrow and talk about North, East, South and West, the children may know a mnemonic to help remember the directions such as 'Never Eat Smelly Wellies' - or you could try to make up a funny mnemonic in your own language. Invite the children to take it in turns to draw an outline map of the site, starting with the boundaries. Ask children what are the big features of the site and where they are on the map. Then invite the children to add each main feature onto the map and create a key in a corner as you do this (e.g. the blue line is the river). Write the title and date (e.g. 'Badger footprint site, May 2016').
- Children get into the same number of groups as there are treasure bags (approximately 2-4 children per group) and each group has a colour-name to match the colour of one of the bags (e.g. the blue group will look for the blue bag). Explain that the next activity is for the children to find the treasure in the bag of their colour.

- Then the educator can work with each group to show them where on the map their treasure is hidden, by marking a cross in the appropriate colour e.g. for the blue bag mark a cross with a blue pen. Support the children to discuss where it is situated relative to the features in the area.
- Each group should work as a team to find their treasure.



HARVESTING

When all the groups have found their treasure, invite them to look inside and share it fairly. Ask them how it was for them to find the treasure, and how it could have been even better.

You could also ask children some specific questions about their day as a way to review it, such as:

- 1) What can we do to make sure we don't get lost?
- 2) What makes a good map?
- 3) What treasure did you get?

Children may go away with their treasure, they could use it for another activity or include it in their free play.

Before you leave, check the site together as a group to make sure that no litter is left behind, and it is left 'as you found it or a little bit better'.

12. PERMACULTURE ETHICS AND PRINCIPLE

This session is an example of:

- **Earth Care** because children appreciate what is in the woodlands, and learn not to hurt living things.
- **People Care** through using appropriate pedagogy for the children, such as group size, listening carefully to children. Also, learning how not to get lost and how to work together as a team to search for the treasure.
- **Fair Share** as the children share their treasure fairly, share their experiences and leave the place as they found it or a little better.
- **Observe and interact** - Observation is the key principle used and explained in this session plan. Mapping is a wonderful way to get to know the landscape better. The process of looking for different

resources found within the site, helps participants to realise what is already there, which they might otherwise have missed.

- **Obtain a yield** - The main yield is education, as children learn more in different ways, as well as physical education (there is lots of movement involved). Another yield is fun and excitement in the woods and connecting to nature.
- **Use and value renewable resources and services** - Renewable resources are used in the treasure hunt where possible.
- **Produce no waste** - Children are reminded not to leave litter in the forest - produce no waste.
- **Design from patterns to details** - The treasure map is created from pattern to details (the overall site, to the location of the treasure).

13. INSPIRATION

14. IDEAS FOR EXTENDING THE LEARNING AND EXPERIENCES

There are many more 'finding my way activities' which can be used to develop the spatial awareness in a playful way. Based on the items the children found in the treasure (or a particular item that raised most enthusiasm) you may start building on a new project or explore a theme based on their interests that came up during the discussions on the item(s).

Relating to this topic, there are many other activities which one could do, such as creating Blobsters (using the treasure they found), 'Find my magic sit spot' or 'Wheel mapping' see Chris Holland's inspirational book 'I love my world' (2009).

V.5 SOIL TEST

By Lusi Alderslowe

1. AGE

8+ years

2. GROUP SIZE

3-15 children per adult

3. DURATION

The first part takes approximately 60+ minutes.

Part B is one hour later, for 5 minutes.

Part C is after 24 hours, for 10-30 minutes.

4. BRIEF OVERVIEW

In this practical activity, the children perform a soil test to find out what texture their soil has - sand, silt, clay or loam. In the process they sing a song, work in teams and find out about what soil is made of. It is a very useful activity to do when designing a garden, so children can later research what types of plants will grow well in the soil which they have.



5. CURRICULUM THEME

Theme		Topic	3-6 years	7-12 years
A	INTRODUCING PERMACULTURE	1. Permaculture ethics and principles		
		2. Connections		
B	LIVING NATURE	3. Soil and stone		✓
		4. Water		
		5. Plants and trees		
		6. The animal, fungus and bacteria kingdoms		
		7. Air		
C	DESIGN	8. Designing		
D	GROWING FOOD	9. Growing food		✓
		10. Preparing food		
E	BUILT ENVIRONMENT AND RESOURCE USE	11. Buildings		
		12. Using nature's gifts wisely		
F	SOCIAL PERMACULTURE	13. My body, heart and mind		
		14. My community		
		15. Our human family		

6. SCHOOL THEME

Mathematics / Language / Science (biology, chemistry, physics)

Social Science (geography..) / Arts (music...)

7. SEASON

Any - when the ground is not frozen

8. SETTING

Forest / Indoors / Meadow / Garden

9. HOLISTIC PLANNING



- Observe how soil dissolves in water and then the different soil minerals separate out.
 - See, touch and smell different soils with different textures: sand, silt, clay and loam.
-



- Collect soil directly.
 - Do the soil jar test.
-



- Sing a song about soil.
 - Experience hands getting dirty with soil.
 - Feel soil and connect to it.
-



- Find out about soil textures and which one is present in their garden/grounds.
- Find out about the properties of soil: what is soil made of? What makes it fertile?

10. PREPARATION OF MATERIALS AND RESOURCES

a) Required Materials and Tools:

The words for the song could be written on a large piece of paper for children to follow.

In addition, each group of 3 children will need:

- 1 transparent glass jar (approx 330 ml) with a lid
- 1 digging instrument (e.g. trowel or spade)
- 1 label for the jar
- 1 marker pen for the jar
- 2 pencils
- 1 ruler
- sand
- clay
- water (approximately 250ml)
- 1 sheet of newspaper
- 1 handout with pictures of soil types (see below).

b) How to prepare space and/or people:

This session plan is best placed within the context of needing to know more about soil, which can be done in a number of different ways, depending on your circumstances. For example, when designing a garden to grow food one of the first things is to learn more about the soil in order to know what kinds of plants can grow there. Or the group could be doing a wider study of soil, or have read stories or done activities which interested the children such that they want to find out more about soil.

11. SESSION DESCRIPTION



SOWING

Sing a song about soil, such as this one by Lusi Alderslowe, the recording of which is on the Children in Permaculture website. The lyrics are:

There's 3 different types of mineral in soil

There's 3 different types of mineral in soil

There's a big crunchy one, it's called sand
down at the beach you feel it in your hand

There's 3 different types of mineral in soil

There's 3 different types of mineral in soil

There's a medium one, it's called silt
it feels soapy when you rub it on your kilt

There's 3 different types of mineral in soil

There's 3 different types of mineral in soil

There's a tiny one it's called clay,
slippery and slidey all the way

There's 3 different types of mineral in soil

There's 3 different types of mineral in soil

Actions for this song, could be:

- 3 different minerals: showing 3 fingers, movement of digging into the soil with a spade
- sand: extending arms out wide
- silt: washing your hands as for soapy
- clay: sliding with legs



GROWING

1. Split into groups

Create groups of three children in which each member has a role. One measures on the jar and writes down the measurements, one does the calculations, one determines the soil type on the diagram. When one member is working the others follow the activity going on at the given time.

2. Collect soil

Each group of three children gets a jar with a blank label on it and write their names on it. Then each group chooses a different area of the garden to gather a soil sample from: it can be from the raised bed, under the tree tops, or the area that is only covered with grass and is in the sun all day etc. Children should dig a hole about 12cm deep and put some soil from the bottom of this hole into the jar until it is only $\frac{1}{3}$ full with soil. They can also note down on a separate paper the location, what type of plants are growing there and whether they are thriving.

3. Touch the soil

Invite the children to lay out their soil onto a sheet of newspaper or similar. Look at the colour, how crumbly it is, how many worms there are. Smell the soil. See if it looks different to the other groups' soil, and compare it to the sand and clay samples that the educator has provided. Discuss.

Invite the children to take a one inch ball of soil in their hands. If it is very dry, then add a drop or two of water (until it is moist but not muddy). Then rub the soil between your fingers and try to make a ball or a sausage. Children can try the same experiment of



making a ball or sausage with the pure sand and/or clay provided and compare it to their soil.

Children will find that sandy soil feels gritty and loose, it won't form a ball and falls apart when rubbed between your fingers. Clay soil is smooth, sticky and it can form a sausage-shape without cracks. Clay soil requires more pressure to form a ball than loam soil, but does not crumble apart as easily. Loam soil is a combination of sand, silt and clay particles - it feels smooth, slick, partially gritty and sticky and forms a ball that crumbles easily.

4. Soil jar test - Part A

Discuss with the children the different particle sizes between sand, silt and clay, the handout below may be useful for this. Let the children hypothesize about which will settle out first.

The children put the soil back into the jar until it is $\frac{1}{3}$ full, removing any living animals (such as worms) which you can see. If there are enough resources (sand, clay, jars and water) each group could also make up a jar with $\frac{1}{3}$ sand, and another jar with $\frac{1}{3}$ clay. Children are then invited to:

- Add water to the jars until they are $\frac{2}{3}$ full.
- Screw the lid on tightly.
- Shake the jars vigorously for 2 minutes to thoroughly mix the soil and water.

- Place the jars somewhere flat that won't be disturbed for the next 24 hours (e.g. on a shelf in the classroom).
- Leave the soil to settle in the water.
- Make sure that everybody gets a fair share in the activity.

After 1 minute, invite the children to draw a line at the top of the settled out soil. Be careful not to shake or mix the layers that have settled out. Notice the difference between the jars with sand, clay and different soils.

It is important that children have some time to play at this point.

5. Soil jar test - Part B

After 1 hour draw another line at the top of the soil which has now settled out.

6. Soil jar test - Part C

After 1 day (24 hours) mark another line at the the top of the settled out soil. Notice the difference between the jars with sand, clay and the different soils.

The educator can refer to the handout with the pictures of the soil jars to each group and explain how to use it.

Each group uses a ruler to measure in millimetres the thickness of each layer of sand, silt and clay, and then write the measurements down. Children can then determine which type of soil they have. For older children an additional activity could be to calculate the percentage or proportion of each mineral type in their soil.

Additional Information for the Educator

Sand settles out of water after 1-2 minutes, silt settles out after 1-2 hours, and clay settles out after 1-2 days.

Healthy soil is made of approximately 40% mineral particles (sand, silt and clay), as it also has air (25%), water (25%), and organic matter (10%). Organic matter is the living things (worms, bacteria etc.) and the once-living things (faeces, dead animals, dead leaves etc.). Soil which is a dark colour normally has a lot of organic matter in it, which means it will be more fertile than light-coloured soil.

This information can be shared with children if they show interest.



HARVESTING

Each group reports back to the whole group where they collected their soil from, what type of plants were growing there, and what type of soil they have. Give time for the children to discuss the differences between the soils taken from different places.

The children could share what they learnt or what was interesting about the soil jar test and what would they would like to do or learn about next.

12. PERMACULTURE ETHICS AND PRINCIPLES

- **Earth Care** - Through observing, touching and smelling the soil children create a direct and deep connection to it. Children learn more about soil and what it is made of, and that there are there are different types of soil.
- **People Care** - Children experience people care through group work, speaking and listening to each other, and learning together.
- **Fair Share** - Children are encouraged to take only enough sand and clay for their needs, sharing the surplus with other children. They are also encouraged to ensure that everybody gets a fair share in the experiment.
- **Observe and interact** - Children experience closely observing soil and interacting with it. They compare soils coming from different places and guess the reasons for the differences.
- **Use and value diversity** - Each child has a role in their group and by working together they are able to support each other as learners. The different types of soil depicts diversity in nature.
- **Everything gardens** - even soil. The amount of each mineral type influences what kind of plants can grow there.

13. INSPIRATION

14. IDEAS FOR EXTENDING THE LEARNING AND EXPERIENCES

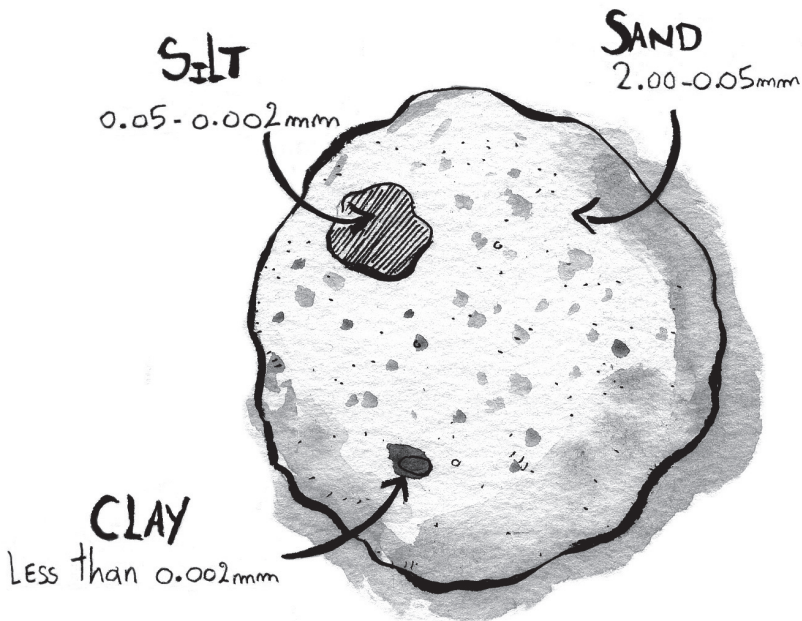
A possible next step would be to find out more about the properties of the different types of mineral, and which plants are likely to prefer the texture of soil in the different parts of the garden.

If one of the groups has soil from raised beds, one could discuss the type of soil that is appropriate for growing vegetables (loam is the type of soil that is commonly known to be suitable for growing a wide variety of vegetables).

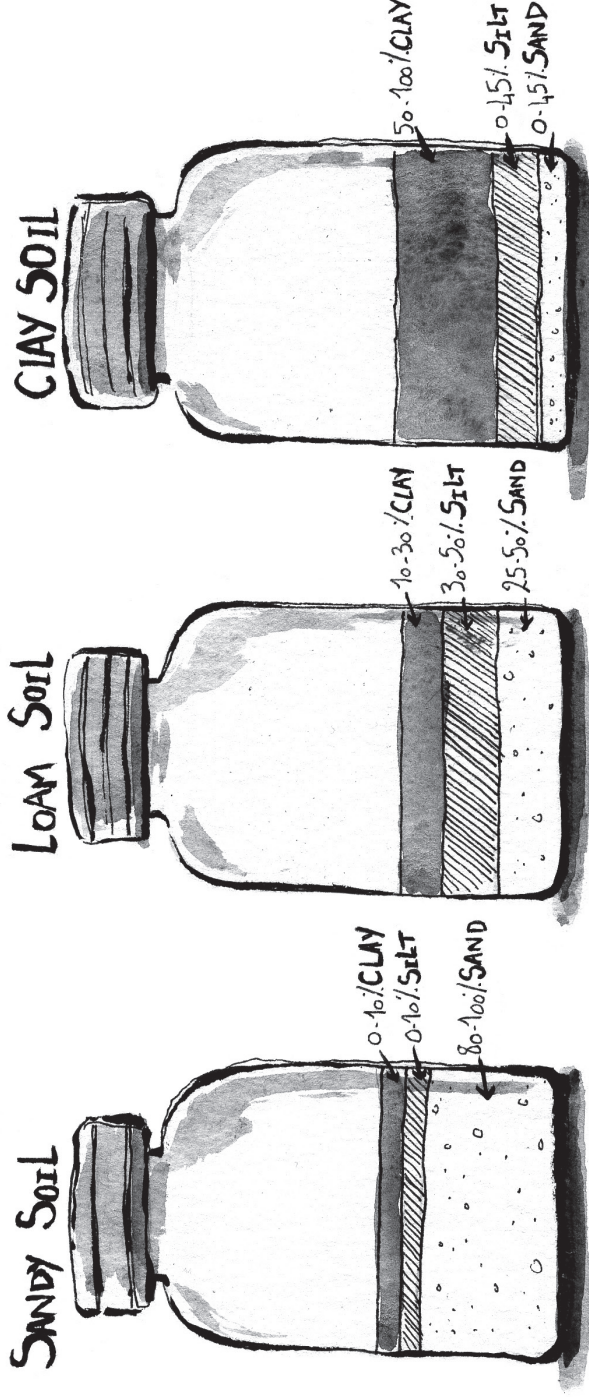
Children could also investigate methods of improving the fertility of soil in the school garden.

15. HANDOUTS

Handout 1 - Soil jar test - Part A



Handout 2 - Soil jar test - Part A



V.6 SHARING IS CARING

By Cecilia Furlan

1. AGE

7-10 years

2. GROUP SIZE

6-10 children

3. DURATION

2 to 3 hours

4. BRIEF OVERVIEW

Children explore the three permaculture ethics in an experiential way through becoming a tribe, expressing oneself in a talking circle, singing a song, sharing natural gifts, and taking care of another child. It enables children to connect with others as well as with nature.



5. CURRICULUM THEME

Theme	Topic	3-6 years	7-12 years
A INTRODUCING PERMACULTURE	1. Permaculture ethics and principles		✓
	2. Connections		
B LIVING NATURE	3. Soil and stone		
	4. Water		
	5. Plants and trees		
	6. The animal, fungus and bacteria kingdoms		
	7. Air		
C DESIGN	8. Designing		
D GROWING FOOD	9. Growing food		
	10. Preparing food		
E BUILT ENVIRONMENT AND RESOURCE USE	11. Buildings		
	12. Using nature's gifts wisely		
F SOCIAL PERMACULTURE	13. My body, heart and mind		✓
	14. My community		✓
	15. Our human family		

6. SCHOOL THEME

Language / Art (Music) / Health and wellbeing /
Social sciences (history)

7. SEASON

Any

8. SETTING

Forest / Beach / Meadow / Garden

9. HOLISTIC PLANNING



- Observe elements in nature while looking for a natural element to share with the others.



- Experience the meaning and feeling of giving and receiving.
- Express oneself within a talking circle.
- Take care of another child.



- Walk in nature looking for and/or making a gift for another child.



- Find out how the permaculture ethics of Earth Care, People Care and Fair Share are related to our actions.
- Find out that people used to live closer to nature, sharing gifts.

10. PREPARATION OF MATERIALS AND RESOURCES

a) Required Materials and Tools:

- A 'talking piece': stone or piece of wood that can be passed around the circle of children.
- The names of each child written on a small piece of paper which is folded and placed in a bag. For younger children there could also be a photograph of the child under their name. This will enable children to pick out the name of another child.

b) How to prepare space and/or people:

A diverse forest or woodland (but it can also be a meadow or beach, the important thing is that the place is rich in things to observe and pick up) with a clear area or two for sitting in a circle (on the ground or on logs). Check the area in advance to remove dangerous litter (e.g. syringes) and do a risk assessment. Ask the children to bring drinking water, healthy snacks and appropriate clothing as required.

If it is cold weather, it may be preferable to have a fire to sit around, in which case the children will already need to know how to be safe around a fire.

11. SESSION DESCRIPTION



SOWING

Sit in a circle and in the form of storytelling describe how people used to live on the land, their way of living in harmony with the Earth, taking care of one another and sharing the gifts of nature.

Make the connections between what you just described and that we are sitting in a circle outside like a tribe. Ask the children if they would like to pretend to be such a tribe now.

Take out a 'Talking piece' and explain that only the person who has the Talking piece can talk. It is better to always put a clear question for each circle. For example, if it is the first circle you do together you can pass the Talking piece around and the children can introduce themselves a little: say their names and an animal they feel connected to that day. If it is not the group's first circle they can talk about feelings (perhaps in relation to the weather/colour etc.) or about anything that feels important to share within the circle. All the others are listening silently, with kindness and in a deep way to the person that holds the Talking piece. Every child has an opportunity to talk with the Talking piece, and if they prefer not to talk they can pass it on.

Once everyone has had their turn, thank the children for showing a good example of People Care and Fair Share.



GROWING

For younger children, the educator may next choose to sing a song or do the 'gift circle' activity so children can move after sitting in a circle.

You can continue by explaining to the children that 'People haven't always had separate bands and specialist musicians to entertain us - people made their own music and sang songs. This was the way people could connect to each other and give thanks to the earth for 'her gifts'. Do you think we could sing a song together?' Invite the children to stand up and sing a song, it is ideal if this can include dancing too. You can sing a song and dance that suits your group, or

even improvise one. This is an example, it is called 'Aye Kerunene' which translates as "Song for the Earth" and is a traditional African song showing gratitude:

Aye
Kerunene
Keranio
Keruna

Keranio Eia Eia Eiae
Aie
Kerunene

Links to the notes, recordings and an example video recording can be found in the reference section on page 134.

- Now invite the children to go into nature to find or make a gift which they will give to another person in the group. Remind the children that to take care of nature they should only pick things which are not alive.
- When they come back to sit in the circle, the educator can show the children the bag full of little papers with their names written on them and explain that the name they pick will be the person they give the gift to.
- The educator can then show the children a little ritual as an example of how they can give their gift - e.g. one child picks a paper from the hat, tells everyone something they appreciate about the gift they have made and how it can be useful or beautiful to the child they are giving it to. Next, the child gives the gift to that particular person, who accepts it with a 'thank you'.
- After everybody has had their turn and the 'gift' circle is over, ask them to put the little papers with names back into the bag.
- Invite the children to pick another name secretly, without telling anyone.
- Explain that the name that they picked is the person they will secretly take care of for the rest of the day by bringing them water, singing a song, giving them a gift or a kind word... anything which



shows they care. Ask the children not to tell anyone who their secret person is.

- Give the children an opportunity to play freely in nature.



HARVESTING

Returning to the circle, thank the children for having experienced the three permaculture ethics of care for the Earth, Fair Share and caring for people. Invite the children to pass around the Talking piece once more, and tell the group what they liked about this experience together and how it could be even better if we did it again.

Close the circle with a big 'thank you'. Hold hands, bend all together to the ground, all together saying 'thaaaaaank' more and more intensely and starting to stand up again until throwing the hands to sky and saying 'youuuuuu'.

12. PERMACULTURE ETHICS AND PRINCIPLES

- **Earth Care** - Emotional connection to what the Earth represents for the children can help them to develop a sense of belonging and caring. This may later bring more awareness when they make decisions such as about what to eat or grow. Also, taking care not to damage plants or trees is a way of taking care of the Earth.
- **People Care** - Behaviours or actions that convey positive feelings or kindness towards others can bring the children to feel how beautiful and worthwhile it is to take care of one another. It is important for both children and adults to know and feel what companionship and collaboration are about by experiencing it.
- **Fair Share** - Learning to give and receive at an early age can help to develop a sense of being content when our fundamental needs are met, therefore an appreciation of abundance and an ability to share the surplus
- **Observe and interact** - 'Beauty is in the eye of the beholder'. This session plan helps the children to observe nature and feel, understand and process what they feel about it.

- **Use and value diversity:** Each child is valued and heard through passing the talking piece. The gifts are all different as are each of the children.

13. REFERENCES

A video of a children's choir singing this song can be found here:
<https://www.youtube.com/watch?v=0S6I2PVAfIE>

The notes and a recording of the music can be also found on this page:<http://www.waldorfschoolsongs.com/song/aye-kerunene-1-2st/>

Manitonquat (2015)

13. INSPIRATION

[illegible]

15. IDEAS FOR EXTENDING THE LEARNING AND EXPERIENCES

If the children are interested in indigenous tribes they could research some, such as people who used to live in their region and explore their lifestyles. This could be by making food, shelters, art, music etc.

Another way of making gifts could be simple dream-catchers made with materials found in the place, or a painting made with natural colours.

CHAPTER VI

PEDAGOGICAL GUIDELINES

Pedagogy is ‘the how or practice of educating ... “It refers to the interactive process between teacher and learner and to the learning environment” (Siraj-Blackford et al, 2002)’ (emphasis in original Wall, Litjens and Taguma, 2015).

The pedagogical guidelines described in this chapter were created by synthesising best practices considered as the most appropriate strategies for children and educators to have positive permaculture experiences. These guidelines give basic information which will support educators to design child-centred sessions which are appropriate to children’s interests, needs, age, development and attention span. When engaging children in permaculture, it is important to create an atmosphere that enables them to have opportunities for self-expression, creativity and exploration.

Educators may find it useful to be mindful of the principle ‘Use Small and Slow Solutions’, as it can take time and practice to build some of the skills described. In each of the sections below, questions have been provided which can support educators to consider pedagogical appropriateness whilst creating their session plan. Note that this chapter gives a very brief introduction to the vast concept of pedagogy, on which there are many theories, practices and research which can be studied in much greater depth.

VI.1 APPROACH OF THE EDUCATOR

The permaculture principle ‘Observe and Interact’ suggests that the educator finds out about each child’s first language, home environment, needs, and interests before meeting the child (e.g. through communicating with parents, carers and/or other educators). Over

time, the educator can observe how each child interacts with others, what they like, what their strengths are and what they need support in. This can help the educator to connect with the child, be flexible to their needs and build on their existing interests. This child-centred approach promotes the well-being of the child. It has been an important foundation of holistic education since the time of Froebel (for more information about Froebel see Bruce, 2012).

To ensure a child-centred approach, educators provide opportunities for children to have unstructured free play - where it is initiated and directed solely by the child. This gives a chance for children to explore, create, discover and experiment with their own ideas and assimilate their newly gained knowledge and skills. During this unstructured play, children can learn how to take calculated risks, make decisions, work collaboratively, share, negotiate and resolve conflicts. Free play is also an important time for adults to observe the children and notice what experiences, interests and needs arise from them.

In addition, the CiP pedagogy embraces a child-led approach, which focuses on enabling children to lead their play, activities and/or projects, in a direction of their own choosing. This can be done in a participatory manner, in which the children initiate an activity and then find the materials, tools and expertise required to complete their project, so they are active leaders in the whole process.

A child-led activity could also be initiated by the educator who could plan a session in which a seed of inspiration can come from anywhere - the child, educator, environment or the CiP curriculum. The educator can take this seed to create a session plan which provides the framework and allows children to express it in their own creative way. For example, a child one week wonders aloud if there are fairies in the forest (seed). The next session the educator tells a story about fairies in the woods (sowing) and says "Would you like to build them places to live and play?" The children can then lead the session in whichever direction they wish - alone or with other children, choosing their own materials and methods, as they create any number of structures, from swings to palaces. This

child-led approach can enable educators to incorporate children's ideas, seeds of inspirations and feedback, into the current or later sessions, adapting the plans to reflect the children's interests.

Reflection questions

- What do we know about the children?
- How does the session build upon children's existing interests?
- How can the educators be flexible in the moment to change direction in accordance with children's interests or needs?
- How does the session include opportunities for the children to be creative, make decisions and take the lead?
- Will the session include unstructured, free play?
- What are the children interested in, excited about or doing and how can I build upon this for future sessions?

VI.2 LEARNING ENVIRONMENT

The learning environment is composed of both the physical surroundings and social dynamics. In a holistic setting, these influence children's learning and development positively, enabling children and educators to create a special place which supports the needs and interests of the children. For further inspiration see the Reggio Emilia Approach (Edwards, Gandini & Forman, 1998). How the child responds to their environment can show whether it is meaningful for them and has diverse opportunities to play, learn and interact. Involving parents, children and educators in the design of an outdoor or indoor learning space can deepen their sense of ownership and empowerment. Many natural environments (such as woodlands and beaches) require minimal work to manage them, and give maximum effect in that they provide possibilities to develop fine and gross motor skills (climbing, running, collecting, touching), problem-solving, an aesthetic sense, emotional awareness and much more.

The permaculture concept of zones can be useful when designing the learning environment. The example below from a primary school can be helpful, bearing in mind that not every location has every zone and they can change over time. Zones are defined by how frequently people visit for maintenance and harvesting, which dictates their preferred distance from the central hub. They are normally drawn hypothetically as concentric circles with the central circle being Zone 0 and the outer circle zone 5, yet in a real school they can be in different locations depending on various factors including microclimates, landscape and existing features.

Zone 0 - The central learning space(s) e.g. the classroom. This can be a dynamic space with each element (e.g. cushions, plants, natural materials) having many functions. Food-growing can also take place here, e.g. sprouts, seed-sowing, seedlings, compost caddy.

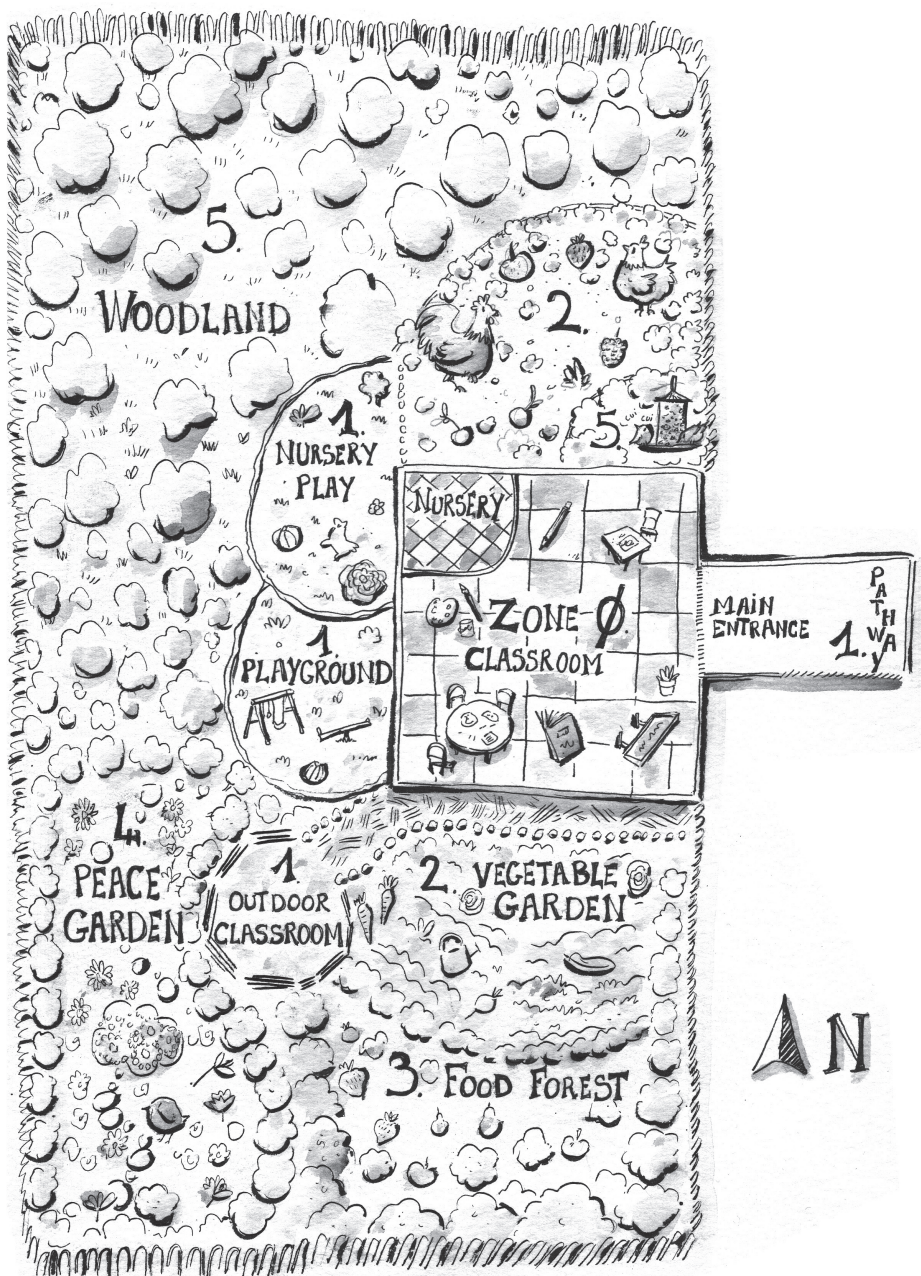
Zone 1 - Area right outside the central learning space and observable from within. This is a good area to have salads, herbs, mud kitchen, youngest children's play area, and an inviting footpath and entrance with artworks and decorations.

Zone 2 - The main area of the garden which is visited by the whole group around 2-3 times per week to maintain or harvest e.g. compost, mandala garden, polytunnel, annual vegetables. Elements such as an adventure play area, den-building and loose parts could also be in a zone 2.

Zone 3 - The garden areas which are visited weekly to maintain and harvest, such as the food forest, potatoes, wheat, rye, etc. Zone 3 can also be places visited weekly off-site such as the central hub of the forest school.

Zone 4 - Places that are visited less frequently either on school grounds, or off-site such as excursions to museums, libraries or good places for foraging.

Zone 5 - This wild zone is not actively managed by people. This could be a woodland area in the school grounds, a local beach or a forest. In permaculture it is useful to have a small zone 5 in the zone 1, this is something which is managed for wildlife close to the school building in order to promote biodiversity throughout the land. For example placing a bird feeder near the classroom window.



Reflection questions

- How does the setting provide stimuli for all the senses?
- What open-ended, safe resources are available for free play?
- Are there different areas within the whole environment which support different activities and changing needs (e.g. a quiet area, music area, wide games area etc.)?
- How can the space be adapted to enable small group work?
- How can the learning environment promote imaginative and creative play?
- How will the learning environment support individuals with different needs (e.g. visually impaired, physically challenged etc.)
- What kind of group climate is created - is it one of acceptance, tolerance, freedom of expression in which children feel valued and supported?
- How can children design and create their own spaces?

VI.3 COMMUNICATING WITH CHILDREN

Communication is a two-way process which enables understanding of each other and exchanging ideas. An educator's language and non-verbal communication aims to be age-appropriate, child-friendly, inclusive, positive and holistic. Educators are encouraged to speak in a kind, compassionate tone of voice where children can feel safe to express themselves. Educators are role models, so children will follow their example and be influenced by their words, tone of voice and body language.

When speaking to children, it is useful to adapt one's language to the child by taking into consideration the his/her age, language (native language, sign language), learning difficulties and development etc.

Some key points for making language child-friendly (Department for Children, Schools and Families, 2008) are to:

- Use clear and short sentences
- Use vocabulary which the children can understand

- Frequently check with verbal or non-verbal cues whether the children understand
- Give children time to respond

In order for communication to embody the permaculture principles, including ‘Use and Value Diversity’, language style can subtly promote equality, embrace and celebrate ethnic, religious, gender and cultural diversity. The ethic of fair share can also be practiced in communication, where each child has an equal opportunity to express themselves and be heard.

Open-ended questions such as “What has changed in the forest since last time we were here?” enable children to think for themselves and encourage creativity and therefore are preferable to closed questions. Closed questions are those with a yes/no answer, such as “Is it sunny today?” and are less likely to initiate conversation. However, there are times when it is useful to ask closed questions, such as to find out what children know, e.g. “Can people eat trees?” and then to listen to the children hypothesising or debating the reasons for their answer.

Rhetorical questions can be confusing, for example

“Children, do you know why it rains?”

“No.”

“Well, it's because....” and the teacher directly explains.

Building on children’s knowledge through dialogue is more appropriate because children have the opportunity to construct their own meanings, exercise their abilities to analyse, think, reflect, problem solve etc. The role of the adult is to facilitate this process and notice what the children are interested in.

Reflection questions

- Is the language used child-friendly and age-appropriate?
- Does the overall tone encourage positive communication?
- How can you consider possible individual differences (e.g. the mother tongue, sign language)?

- How will the language used show sensitivity towards ethnicity, gender, language, special needs, home life (including LGBTI awareness, single parents, adopted children etc.)
- How can most of your questions be open-ended ?
- What are children interested in, are you listening deeply to them?

VI.4 DEVELOPMENTAL APPROPRIATENESS

Children have a continuous developmental timeline - physically, socially, cognitively, emotionally and linguistically. Different individuals will develop different aspects earlier or later than others. This is useful to keep in mind when planning, so that activities will engage the children and enable them to develop their skills at a level suitable to them. As there are always exceptions, and some children will be developing certain skills earlier or later than others, you can plan to facilitate peer to peer learning in which children share skills with others. Examples of online resources regarding development include Ontario (2006) and Teaching Strategies (2001).

Which activity is appropriate will depend upon the child's age, interests, development and previous experiences. For example, identifying three leaves can be appropriate for one group of six year olds; whilst identifying one leaf may be appropriate for a group of four year olds; whereas for three year olds identification may not be necessary, but rather just exploring leaves with all their senses.

Reflection questions

Is the activity and content developmentally appropriate for the age of the children:

- Physically (according to the gross and fine motor skills needed)?
- Socially and emotionally (according to cooperative skills needed / prosocial behavior, responsibility for self and others)?
- Cognitively (learning and problem solving, concrete vs abstract thinking, ability to use symbolic thinking or representation)?
- Language development (abilities to speak, listen, comprehend, read or write)?

VI.5 DURATION AND NUMBER OF ACTIVITIES

Although some sessions may be completely child-led, there will most likely be times when adults introduce a planned activity such as a game, story or craft. When planning such activities, educators will find it helpful to bear in mind that children cannot generally concentrate for as long as adults. There is a large body of research into attention and it is not the scope of this chapter to summarise it, however it is useful to note that children's level of attention depends on many factors including the activity, age, individual differences, group size, time of day, setting and much more. As a general guideline, a maximum length for one activity in which children are sitting and listening, such as a story, could be 5-20 minutes (e.g. Neville, 2007). When designing a session it is useful to consider the children's needs and create a balance between different activity types offering a rhythm with 'breathing in' activities which require more focused attention and 'breathing out' activities which have a more energetic or playful mood (adapted from Waldorf pedagogy e.g. Drąsutė and Umbrasaitė, 2015 and Cornell, 1979). For example, circle time followed by an activity which involves movement and child-led play.

Reflection questions

- How can this activity be adapted to ensure that the duration is appropriate for the age?
- Does it include changes in activity type, e.g. from sitting to moving?
- Is free play integrated into the design of the session?
- Are the number of activities appropriate for the age and duration?
- How can you make sure the session does not include too many activities, giving space for children to be creative and lead the session in a different direction?

VI.6 GROUP DESIGN

Two main factors of group design are discussed here - the number of children and the ratio of adults to children. In addition, there are likely to be many other factors in designing a group depending on the circumstances, such as who the educators will be, how the children will be split into groups etc.

When designing the adult:child ratios and the number of children in the group, it is useful to consider the following:

- Age and ability of group
- Nature of activities
- Experience of adults
- Duration and nature of the experience (will you be far from services e.g. roads, hospitals)
- Requirements of the organisation or authority etc.
- Setting (within school grounds or going to a forest, climbing mountains etc.)
- Site capacity and requirements
- Previous experience of that adult with those children
- Additional support or medical needs
- Number of specific tools or aids you have available
- What will happen if one child is injured?

The ratio of adults to children which is suitable varies. An adequate number of adults ensures that the children are able to stay safe and that the experience is nurturing. If adults find themselves focusing more on managing a large group than on interactive learning experiences, it probably indicates that they need more support. In the CiP approach, a high ratio of adults to children tends to be required in order to empower children. Such a ratio can be achieved with the help of a colleague, volunteer or parent. If going off-site (off the kindergarten or school grounds) it is always necessary to have two adults.

In determining the maximum group size the following reasons for keeping groups smaller should be considered:

- Having space for quieter times
- Being able to hear every child's experiences and thoughts
- Individualising attention to each child
- Creating a conducive environment for learning
- Personalising learning experiences
- Safety (including in case of an emergency)

Applying the principle of 'Observe and interact' and learning from practical experiences can help to discover the number of children to have a fruitful, satisfying ratio in your situation. If you have more children, the suggestion is that you split into two groups to enable each educator to be able to hear every child. With two adults, the ideal group size when going off-site (e.g. to the woods) is:

- 6 for 3 year olds
- 8 for 4 year olds
- 12 for 5-9 year olds
- 14 for 9-12 year olds

Reflection questions

- What will make an appropriate group size, which has enough children to enable social interaction and not too many to hear everyone individually and tend to their needs?
- If there is an emergency, with one adult doing first aid or away in an ambulance, is there adequate cover for the remaining children?
- How can the ratio of adults to children ensure that everyone will enjoy the session, be nurtured and be learning from each other?

CHAPTER VII

TOP TIPS FOR EVENTS

Creating events which engage children and adults is important to promote inclusivity and to make sure the event is as enjoyable as possible for all. This chapter firstly gives ideas for including the whole community in a school event, and secondly for engaging children in an event which is mainly aimed at adults. For more information and ideas about how to promote events and disseminate your work or project, see the appendix “Inspiring others”, downloadable from the Children in Permaculture website.

TOP TIPS FOR SCHOOLS TO ENGAGE THE WIDER COMMUNITY

- Before organising an event, get to know your local community. Listen to the needs and traditions of people in your area and organise an event(s) to meet their needs. For example, consider people of different religions, physical abilities and dietary requirements.
- Involve children, parents and other key members of the community in organising events. This will help to integrate different parts of the community and increase the dissemination of your message as they will tell others about it, before and afterwards. For example, you could invite a horticulturist, church member and sportsperson to work together to create an event that will attract different groups of people. This could trigger a snowball effect resulting in more people getting involved in the future.
- Invite members of the local community to share their skills with children e.g. gardening, cooking, knitting, sewing, repairing, carving, singing, art and/or music. This could be on a regular basis e.g. Friday afternoons.

- Organise regular (e.g. annual) big events such as a theatre show, garden spring clean-up, or harvest celebration (e.g. with food, flowers and herbs from the garden).
- Go out from schools into the local community, for example have a stall at a local market, write articles for a local newsletter or newspaper, organise a tree-planting day or a park/beach/forest clean-up.
- Involve the wider community in 'walking buses', 'cycle trains' and other active ways to travel to school/kindergarten. This is when a group of children walk, or cycle, to school with one or more adults.
- Invite the local community into the school grounds to build or create new spaces e.g. create a new garden, build an outdoor classroom, construct a polytunnel.
- When organising practical work-days with children, parents and teachers, find out how many adults and children will be present, and plan the time so that all the work can be completed in three hours maximum, with a little break and time at the end to celebrate.

TOP TIPS FOR ORGANISING CHILD-FRIENDLY EVENTS

When organising a permaculture convergence or other event for people of all ages, it is important to ensure that children are considered in the overall design. Below are some top tips for doing so:

Create a fun, outdoor children's space for exploring and playing. Ideally it would have:

- Trees (for shelter, climbing, hanging things in).
- Well-defined boundaries (so children know whether they are in or out of the children's area).
- A seating area (could be a circle of logs, in the centre of which you could have a raised fire).
- A big shelter (e.g. a big tent or yurt) to have activities in when it's very wet/hot.
- A baby area (e.g. small yurt for parents to take babies or toddlers) with soft cushions, nappy change, baby books, natural toys etc. (items with a variety of textures, colours, sounds, and patterns).

- An area packed with potential things to play with. Try to use recycled materials (e.g. wood, clay, paper, cardboard boxes, wheelbarrows, sticks, pots, pans, wooden spoons, a play kitchen etc). Allow space for children to create their own games and activities.
- Sugar-free snacks (e.g. bread, fruits, rice cakes, carrot sticks) and drinks (water where children can refill their bottles and fruit juices) available day and night for young families.
- Natural decorations which children and adults can use to beautify the spaces.
- Child-friendly toilets (where children won't have to queue with adults), this could be as simple as an outdoor pee area with a tarp around it for privacy.
- A space for parents to exchange used toys, clothes, books and other items for children.



Involve different adults with different roles:

- Experienced outdoor educators who meet the rules and regulations in your country about who can look after children. At least one adult on duty should always be an experienced outdoor educator and preferably be familiar with the CiP pedagogy. This crew could attend daily meetings during the event to check-in, go over the plan for the day and share reflections about the children.
- Parents can help on a rota, for example for one hour per day.
- Other people who are attending the event may have useful/relevant experience to offer in the children's area. So in order to 'Integrate rather than segregate' arrange in advance for them to lead a short session with children e.g. an optional puppet-making or music workshop. One of the experienced educators will also need to be there.

Organise the event well in advance:

- Set up a system for parents to 'sign-in' children to be looked after, making sure you collect all the necessary information about allergies etc. It may be necessary to have a minimum age for minded children, which will depend on the rules in your country and the experience of the educators. A maximum age isn't necessary because children whose parents decide that their child is old enough to leave the children's space without an adult can come in and out as they please.
- Set up all the systems for the children's area in good time: venue, registration, rota, toilets, food, flexible timetable, activities etc.
- Offer activities, such as stories, games, crafts, fire, woodcraft, music and/or art. See chapter four for ideas.

Design the rest of the event (outwith the children's area) to be child-friendly by:

- Serving main meals at a child-friendly time (e.g. 5pm) in a system which enables children/families to eat first.
- Ensuring the menu options include mild, plain, separate foods and that highchairs are provided.

- Creating a family camping area with a fire/ socialising space very close by (so parents can socialise in the evenings and still be close enough to their baby to hear if s/he wakes up), and far enough from loud music in the evening (remembering that children often go to bed at 7pm). It is best if this is close to the children's area.
- If there is music, having an area in which the music can be heard, but not too loudly, where parents and children can relax.
- During workshops, talks etc, if there is a baby sleeping, consider quiet ways of appreciating without clapping (so as not to wake them).

CHAPTER VIII

GO FORTH

Children growing up today face an uncertain future with significant changes in climate, weather extremes, resources, biodiversity and more. It is a time when society needs to accept feedback from the Earth and respond to it. Both children and educators can be part of the solution through connecting to nature and bringing the ethics and principles of permaculture into education.

This manual explores various aspects of education through the permaculture lens, hoping to inspire educators and policy-makers to improve sustainability throughout the field. The CiP approach aims to empower educators and children to become resilient co-creators and practitioners through delving into an ocean of learning, exploring their learning edge, taking calculated risks, responding to change and finding sustainable solutions learnt from mimicking nature. When children can design their own learning, experiment, directly experience nature and educate others, they can generate their own understanding of the world becoming more engaged, confident and empowered.

Now is the time to go forth, integrate permaculture ethics and principles into your work, school, kindergarten and/or home, spend time in nature and let children take the lead. See how over time you can explore all the themes of the CiP curriculum, enjoy memorable moments and play, play, play!

GLOSSARY

Activity – a specific action that a person or group does e.g. den-building, sowing seeds, a game, story, song, art, craft etc. It can be a building block of a session plan, which may include several activities to create the natural flow of sowing, growing and harvesting and engage the whole child.

Child-centred – an approach which prioritises the interests, wellbeing, views and needs of children, putting the child at the centre.

Child-led – an approach which focuses on enabling children to lead their play, activities and/or projects in a direction of their own choosing.

Children in Permaculture (CiP) – European project funded by Erasmus+ to explore best practice for sharing permaculture with children.

Curriculum – a list of themes with topics for sharing permaculture with children.

Design tools – physical and thinking tools which are used to aid each stage

of the permaculture design process, e.g. mapping and client interviews during the observation phase, or overlays for design by limiting factor.

Dissemination – activities to publicise your project and spread the results widely in the outside world.

Educators – people who educate others. In this document, educators are referred to as adults who are involved in educating children in formal, non-formal and informal settings, thus can include school/ kindergarten teachers, classroom assistants, nursery assistants, head teachers, parents, grandparents, foster carers, homeschoolers, childminders, Scout/Guide leaders, tutors, Forest School practitioners and anyone else who is aware of their role in the education of a child.

Formal education – education within a school setting.

Informal education – education at home, whether the child is also at school or not, can be done by parents, grandparents, guardians,

carers, or other members of their family or community.

Inspiration for activities – one sentence ideas to inspire educators to facilitate activities which can engage children holistically, using the ‘eyes, hands, heart and head’ model.

Kindergarten – educational institutions and learning spaces for children ranging from age two to seven years.

Non-formal education – education in an out-of-school group such as Scouts, Guides, Woodcraft Folk, after-school clubs, playgroups etc.

Nursery school – educational institutions or learning spaces which offer early years education for children aged zero to five years. It is a term used in the UK and USA.

Outdoor classroom – a physical structure built for children to learn outdoors. It usually includes seating and often has a roof without walls.

Outdoor learning space – any outdoor space designed for children to be learning, including raised beds, polytunnels, composting systems, log piles, woodland, pond and/or outdoor classroom etc.

Pedagogy – the method of teaching, the ‘how’ rather than the content of ‘what’ is being taught, and the learning environment.

Permaculture – derived from the words ‘permanent’ and ‘culture’, permaculture is defined by Mollison as “the harmonious integration of landscape and people providing their food, energy, shelter and other material and non-material needs in a sustainable way” (1988, p. ix). Permaculture has become a worldwide movement encompassing practices for sustainable living.

Permaculture design – is a process through which people can create systems which mimic nature’s patterns, giving maximum effect for minimum effort. Permaculture design processes include careful observation of both the people and landscape, analysing the data gathered, making design decisions, planning the implementation and creating low maintenance systems.

Principles – permaculture is based upon principles which have been learnt from indigenous people and through studying nature. Five attitudinal principles were initially described in Bill Mollison’s ‘Permaculture a Designer’s Manual’ (1988). Later, David Holmgren in ‘Permaculture Principles and Pathways beyond Sustainability’ (2002) described 12 principles which are now the most widely cited permaculture principles. In this manual both Mollison’s and Holmgren’s principles are used, as appropriate.

Resources – material that can be used for sharing permaculture with children such as books, magazines, lesson plans, curricula, videos, websites and more.

Session – a period of time arranged for a particular activity or series of activities. A session may include time with planned activities and/or time without planned activities (free play).

Session plan – a description of an educator’s plan for a session with children. It is likely to include what, how, where and why to lead the session. A CiP session plan ideally includes the natural flow of sowing,

growing and harvesting and engages the whole child holistically.

Sub-topic – an age-appropriate subject within each topic of the CiP curriculum. All of the sub-topics which are relevant for 3-6 year olds are also relevant for children aged 7-12 years, but not vice versa.

Theme – a broad subject area within the CiP curriculum. Each theme includes one or more different topics.

Topic – a subject within each theme of the CiP curriculum.

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To find out more about the Children in Permaculture project and to inquire about training courses, please visit our website for the latest updates: www.childreninpermaculture.com



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