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Objectives
At the end of this chapter, you will be able to:

- recognise of the imperative of incorporating environmental activities into the early childhood centre
- describe how environmental education operates in, about and for the environment
- relate how environmental education and science complement each other in early childhood centres
- describe ways in which adults can scaffold children's explorations using science as the vehicle through which to inform environmental knowledge
- appreciate how settings and activities can enhance children's understanding of the world.
This chapter discusses a growing worldwide concern for the sustainability of our environment and ways in which young children can be provided with explorations of an environmental nature. It embraces the notion that young children can develop empathy for living things, a knowledge of ecosystems and an understanding of the inter-relationships between elements of their environment. Educators can enhance this learning through pedagogy and scaffolding practices.

**Environmental sustainability**

There is a growing concern worldwide about the ability of our planet to cope with the demands being placed on it for resources and the sustenance of life in the long term. The term ‘education for sustainability’ has become a catchcry of both educators and politicians alike. What does this actually mean? Julie Davis (2010) commented that, ‘... sustainability emphasises the linkages and interdependencies of the social, political, environmental and economic dimensions of human capabilities’ (p. 2). There is a real and compelling necessity for humans to change the ways in which we do things if we expect the resources of the world to continue to sustain life into the future. Lindemann-Matthies (2002) commented, ‘To safeguard the global richness of lifeforms, it is essential to raise public awareness about the need to preserve biological diversity’ (p. 22). Currently, humans are, in general, living beyond their means when it comes to the resources of the world (McMichael, 2008). Current research suggests that we are using non-renewable resources such as oil, coal, timber and water at a rate that cannot be re-stocked for future generations. Our consumption is high and our waste is great. According to McMichael (2008), since 1990, there have been increases across many of our basic resources:

- 16-fold increase in energy use
- 40-fold increase in industrial production
- 9-fold increase in water use
- 35-fold increase in fish catch
- 17-fold increase in carbon-dioxide emissions
- 13-fold increase in sulphur emissions
- increase in deforestation and desertification
- 3–4-fold increase in world population (past 100 years)

(adapted from McMichael, 2008, p. 5)

In particular, it is incumbent upon all of us to take action to reduce the amount of materials we use, to try to slow down the degradation of our natural ecosystems and to provide a sustainable future for the multiples of future generations yet to arrive on Earth. Our young, our parents, our neighbours, our communities and our politicians need to be educated about the perils of current lifestyles. Education is a key deciding
factor in determining whether we are able as a society to make changes substantial enough and fast enough to halt what is already occurring. Within this scenario, one strong element in which even young children can make a difference is in the area of environmental sustainability.

... in the preschool and elementary years, small-scale actions at the level of the classroom, the school yard and the local environment are most appropriate. (Chawla, 2007, p. 438)

Research by Chawla (1998) found that modelling of environmental attitudes and behaviours by adults, as well as experiences in the natural environment, were important in young children’s development of environmental concerns. In terms of the environment, young children can become carers of the Earth and through education can come to understand the ecological and social implications of our interference with the natural systems of our planet. Through education, young children can become empowered to act on behalf of themselves and others to create a sustainable environment. Research by Chawla (1998) discovered that adult environmental activists were able to comment on significant early life experiences that enhanced their appreciation for their environment.

Photograph 8.1: This young child is very careful in her handling of the snail – already exhibiting an ethic of care for animals
Developing a 'caring' attitude in young children involves more than just caring for the environment. It is related to doing 'acts of caring and having an ethic of care within our everyday lives' (Wilson, 2008, p. 8). For young children this means developing inter-relationships with people and places (Lyttledyke & McCrae, 2009) and displaying a love of nature, or 'biophilia' (Wilson, 2008, p. 8). As this occurs, so do young children develop concern for their environment and become more environmentally aware.

Environmental education for sustainability

Environmental education for sustainability involves approaches to teaching and learning that integrate goals for conservation, social justice, cultural diversity, appropriate development and democracy into a vision and a mission of personal and social change. (Department of Environment and Heritage, 2005, p. 13)

Environmental education has been incorporated into both school and community education internationally for many years (Campbell & Robottom, 2008). At first, the overall theme was one of conservation; however, with the realisation that there are some life forms and ecosystems that have been irrevocably changed through human intervention, there has been a shift to developing and/or understanding sustainable patterns of existence. For young children, environmental education needs to provide them with knowledge about the Earth upon which they live, it needs to provide them with experiences within a range of environments including natural environments and it needs to give them a sense of power to make changes within their world. But most importantly, it needs to give them a sense of wonder about their natural world and a sense of joy in being in it.

Environmental education typically has taken a three-pronged approach: education about the environment by being in the environment; education about the environment by providing knowledge and understanding of the Earth's ecosystems and the balances between them; and education about the environment by involving children in being capable of action on behalf of the environment.

Education within the environment

With education in the environment, the environment is used as a medium for learning. The local community and environment are used as a starting point to teach a range of ideas, both socially and conceptually, in language, arts, mathematics, social studies, science and other content areas (Sobel, 2004). Environmental education programs need to be run simultaneously with contact with nature – providing contextual inspiration for learning about sustainability and developing a relationship of respect for the environment. With an emphasis on hands-on experiences with
a real-world focus, children’s understandings can be enhanced (Sobel, 2004). In a major initiative in the United States (1995–8), over 40 schools participated in a program of Environment as an Integrating Context (EIC)-based learning (Lieberman & Hoody, 1998). The results of this research highlighted many of the benefits of using the environment as a context for integration, with increased student achievement being measurable across all areas. However, in early childhood, one of the main purposes of education within the environment is to provide circumstances that allow children to increase their knowledge of their natural environment and develop an awareness of their roles in relation to the environment. The early childhood educator must provide opportunities for children to participate actively in the natural environment.

Photograph 8.2: A visit to the local park can provide opportunities for a child to actively participate in nature.

When children learn about the environment, they are developing understandings and knowledges regarding a number of key principles and concepts. These include, but are not limited to:

- Sunlight is the basis for all life on Earth (air, soil, water) – energy flow.
- Cycles – life revolves around cycles (live, die, decompose, evaporate, precipitate).
- Diversity – the range of differences between species, habitats and genetics and their balance.
- Inter-relationships – species interact and depend on each other.
- Change – all natural places are slowly changing – invisible evolution.
- Adaptation – species develop new ways of succeeding.

(adapted from The Institute for Earth Education <www.eartheducation.org>).
As young children interact with their natural environment – and where interaction is scaffolded by adults – their appreciation of these elements is heightened. In particular, this is how science fits best into environmental education. If we accept that science is no longer considered to be just a presentation of facts but is socially entwined with communities and people, we can see that as children start to understand the science behind the ecosystems, life and living things, they also gain an appreciation of environmental education for sustainability.

While there are five recognised major environmental issues, with young children we would only discuss these in the most conceptually relevant of terms and understandings. One thing we do not want to do is to develop a sense of doom and gloom about the world in which we live. The five issues are: the exponential growth of the human population; energy consumption, waste and the greenhouse effect; the degradation of soil, air and water (pollution); lifestyle, production and consumption; and the threats to biodiversity and the extinction of species. We can provide children with examples of these, in response to questions that may arise through children’s own interests, but we need to ensure that we are projecting a positive view of the future. With children, we can give examples of how humans have already made changes that will have a positive impact and we can highlight what we can do in the future, giving children an opportunity for future action themselves.

Education for the environment
Education for the environment requires action to be taken on behalf of our environment. It requires change to the ways in which we do things that have negative impacts on our environment. It means that people need to recognise that some human actions are causing problems in the environment, and that change to human practices is the only way to remedy the problems.

In an early childhood centre, an environmental education program needs to be aware of the requirement for action for change. Although there are limited opportunities for young children to have an impact, there are ways that educators can ensure that when the time is right, young children feel empowered to take the action. Thus, an environmental education program must contain ways to build confidence in young children, both about themselves as ‘holders of knowledge’ of the environment and also about their rights and responsibilities to act on behalf of the environment. An environmental education program in an early childhood centre therefore needs to build children’s understandings about the environment, through play in the natural environment and teacher-instigated explorations. The science of biology and the understanding of how living things are inter-related provide children with the background to make judgements within the environment, about the environment.

There needs to be a ‘wonderment’ about the environment. For example, snails should not be seen as pests that eat the plants in the garden, but as exquisite living
creatures that have a life cycle, which children are able to observe. Worms should not be seen as wriggly, cold wet things, but animals that have a positive influence on our soil and gardens, and which also have an interesting life cycle. Through the use of the environment, we want to build children’s motivation to retain the environment as it is and hopefully build their confidence to make a difference when circumstances permit them to do so.

But what can young children do?

**Children exploring the natural world**

There is a small but significant number of research studies (Louv, 2005; Thomas & Thompson, 2004; Davis 2005) showing that some young children are disconnected from nature and the natural world. This has been termed 'nature deficit disorder' by Louv (2005, p. 34), who explained that the children with this disorder have diminished sensory use, attention difficulties and physical and emotional illnesses. In a further study of children’s access to natural environments, Thomas and Thompson (2004, p. 3) found that:

- There is a big gap in equality of access to high-quality natural environments between children from rural backgrounds and children from urban backgrounds.
- Children have a strong sense of the environment as a social space and this influences the ways in which they use public spaces for outdoor play and personal development.
- Assessing danger is children’s top priority when thinking about different environments.
- Many older children have a good grasp of environmental issues but gain their most powerful understandings through exploration of their own natural environment. However, this need is being constrained by restrictions on access to the outdoor environment.

A number of reasons can be suggested for this erosion of involvement in the natural world, all related to contemporary family life. In Australia, backyards are smaller than in the past, restricting children’s free play; playgrounds have been stylised to reduce injury and play is highly directed (natural spaces are not usually part of a playground area); television and computer games promote a sedentary ‘indoor’ lifestyle; and safety is of primary concern regarding children playing outside, with many parents restricting outside time due to perceived ‘stranger danger’.

If we accept the findings from research, we need to ensure that early childhood centres do incorporate environmental education into their programs. In early childhood centres, there usually are ample spaces and places for free and directed play in natural spaces. Within these natural spaces, children can play safely and can engage with the diversity of living things under the watchful eye of the educator. Educators
can use these spaces for introducing children to natural things and helping to set up
children’s own investigations.

As indicated by Elliot (2010), ‘The challenge today is to extend on these preced­
cents in meaningful and authentic ways relevant to the current challenges of sus­
tainability’ (p. 63). The dilemma for early childhood educators is then how to achieve
this in the early childhood setting through pedagogy and practice.

**Pedagogy and the early childhood educator**

As an early childhood educator, how can you cater for children’s needs in terms of
developing their environmental understandings and love of nature? Some sugges­tions include:

- playing with natural objects
- playing in natural places
- incursions
- excursions
- teacher-led explorations.

**Playing with natural objects**

Early childhood centres have used the nature table as part of their inside environ­
ment for many years. Usually, it is meant as a static display at which children can
stop, look, touch, smell and sometimes taste an object. Children gain an apprecia­tion
of the size, weight, texture and shape of an object through this interaction. However,
another approach would be to provide children with a range of natural materials that
they can use in play. This allows a more open-ended approach to the use of the object.
Children’s imaginations allow them to see the material in different ways and with dif­
ferent purposes. For example, grass can become someone’s hair, or a tree branch a
small boat. Other examples of materials that can be used for imaginative play include
seed pods, leaves, small branches or twigs, shells, sand, gravel/soil, clay and small
rocks. The opportunities for creative use of natural materials are endless and only
limited by the individual’s imagination. Elliot (2010) suggested that play with natural
materials ‘supports cultural inclusion’ (p. 64) as the value of the items being played
with is created by the play participants, rather than any predetermined contexts.

**Play in natural places**

Playing in natural places creates greater challenges for children as these outside
spaces are not ergonomically ‘safe’ environments. Overhanging branches need to be
avoided. Kneeling on rocks requires care. Even climbing low tree branches requires
controlled use of motor skills, hand–eye coordination, an awareness of branch tex­
ture and branch strength. The outside natural environment requires greater concen­
tration to move about freely. In addition to the physical movement in natural spaces,
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children can interact with a vast range of living and non-living natural materials. They can smell the earth after a rain shower, or watch how water pools in indentations in the landscape. Children observe that snails move about after rain or that ant activity increases before it rains. Natural surfaces may become more slippery and require greater care and concentration to navigate.

When children play in the natural environment, they are able to observe the small animals that are part of that environment. Holding snails, worms or slaters can fascinate children and provide them with empathetic approach in handling other living things. They can gain some understanding about habitats when observing where they find these small animals. With scaffolding, they can be guided to closer observation of the animal, noting physical characteristics and linking these with living requirements. For example, noting that a slater can roll up into a ball to protect itself from predators or harm. There are many opportunities for an educator to use these children’s explorations for guided discovery and to scaffold children to a greater level of understanding, care and empathy for the natural world.

Incursions

It seems that there are many opportunities for bringing into the early childhood centre those things that are not normally part of the environment. At the simplest level, a new baby or a new pet visiting the centre may become the focus of discussions about growth, life cycles and the needs of living things. Commercial groups can be hired to bring in, for example, small farm animals and to provide experiences for children to learn about the needs of these animals and their place in our society. Reptile incursions can be used to show children animals they have never seen, to develop their awe at the diversity of animals and also to highlight the dangers inherent in touching or interacting with unfamiliar animals. One advantage of an incursion is that the early childhood educator can prepare children for the visit by reading stories or instigating discussions prior to the arrival of the incursion. This serves two purposes. It provides the educator with information about the prior knowledge children have and gives children a sharing time to help develop concepts and common language. Discussion after the incursion also allows this cognitive development and language development.

Example of an incursion and the ongoing learning

Children at the early childhood centre had been involved in an incursion where they were introduced to the life cycle of amphibians, specifically frogs. In addition to the incursion, they were given some tadpoles to look after and which were to be returned to the incursion group at a future date. Over several days, children watched the tadpoles in their tank with interest. As a follow-up to the incursion, the early childhood educator brought in some photographs of frogs to stimulate discussion. During the discussion children indicated that they were aware that the tadpoles came from eggs
and that the tadpoles would eventually turn into frogs. As the children seemed to have a good grasp of the life cycle of the frog, the educator then discussed the habitat of the frog and the importance of the frog (and therefore tadpoles) in the ecosystem. The children exhibited some empathy for the tadpoles they had at the centre and were concerned for their future. However, they were reassured that the frogs would be returned to their native habitat.

**Excursions**

Again, the variety of excursions available to early childhood centres is large, allowing for an educator to plan extensively for the excursion to be used to enhance children's environmental appreciation and understanding. Local parks and gardens can be used as enrichment environments to complement the natural environment around the centre. Other venues such as aquaria, beaches and local waterways can be used to introduce children to aquatic wildlife and birdlife that form part of the ecosystems. Botanical gardens, zoos, wildlife parks, farms and interactive science museums can provide opportunities for enhanced explorations, new investigations and can add to and challenge children's prior experiences. Often, larger organisations are able to provide a guide or other resources to extend the children's experiences.

**Example of excursion to a local park**

Four to 5-year-old children visited the local park with their educator, other centre staff and a number of parents. At the park they were organised into small groups of 4–5 children and assigned a 'helper'. They then participated in a number of activities, each lasting about 30 minutes. The activities included: a small animal hunt; ponding activities using nets and microscopes; bird spotting; collecting natural debris for an environmental collage; tree hugging; and environmental 'I-spy'. They completed three activities before lunch and three activities after lunch. Each activity involved a great deal of discussion with the adult helpers, who had been provided with information about the environment and habitats. Children could examine elements of the environment at close hand, ask questions, seek their own answers and, in general, learn about the environment by exploring in the environment. The educator followed up their excursion once back at the centre, by providing opportunities for children to discuss what they had seen and found, and its place in the ecosystem. She discussed ways they needed to behave around living things and encouraged a set of values around caring for living things in the environment. Many parents were enthusiastic about the environmental day, indicating that the children had demonstrated a fascination about the environment and a sustained interest in living things.

**Teacher-led explorations**

A teacher-led exploration may arise from a child's interest or may be used to introduce children to new things that may not be a normal part of their natural environment.
An example of this is the planting and maintenance of a vegetable garden. Children can be involved at all stages, from the mixing of the soil with nutrients, planting seeds, watering plants, watching plants grow, harvesting any vegetables, through to the preparation of vegetables for eating. This simple activity can help children understand about the energy requirements of the plants, the requirement to nurture growth and the purpose of the vegetables as a societal need for food. An early childhood educator can stimulate discussion around the needs and the characteristics of living things.

Other explorations may be around aspects of the environment that would not normally be part of a child’s life, but might arise through events or news items. For example, when severe weather conditions arise and cause devastation in some regions, the early childhood educator can set up models to mimic the conditions and help children understand how they can occur. Tsunami, volcanoes, hurricanes, cyclones and floods can be explored using models and can help children understand these phenomena as they occur throughout the world.

Examples of a teacher-led activity

Rocks with 3-year-olds

The teacher set up a range of rocks, pebbles and stones on an outside table. These included black garden pebbles, coarse gravel, blue-stone rock, stones and sandstone. A group of three 3-year-old children came over to explore. The teacher wanted the children to gain an understanding that rocks can vary in shape, colour, texture and mass. The teacher asked a range of questions:

What do we have here?
Answer: Rocks

How do you know they are rocks?
Answer: They just are. You can bang them and they don’t break.

What do we use rocks for?
Answer: Don’t know. For carting. Making rock piles.

Where can we find rocks?

The children sorted the rocks into types, sizes and colours. They observed that some were smooth, some rough and one had little holes all over it. They talked about size and weight. They noticed texture and colour. They went exploring in the outside environment to see if they could find any rocks and found the stepping pavers, little rocks in the garden and some in the concrete path. The teacher ended the activity at that point.
Reflection

How could the teacher use this activity or extend this activity to help children become more aware of environmental sustainability?

Exploring sunflower seeds

The children were gathered around the sunflowers growing in the garden and remarked on the fact that the flowers had lost their yellow colour and had gone brown. When the educator asked them why this might have happened the children replied that the flowers had died. The educator discussed with the children whether they thought the rest of the plant was dead and then proceeded to take off the heads of the sunflowers. The children sat down with a bowl and some tweezers and extracted the seeds from the flower heads. They were completely engrossed in the activity. While they were involved the educator asked another question: What would be the best temperature to grow the seeds? Answer: Hot. Very hot.

The children were talking and sharing their own knowledge of the plant, indicating that the birds liked to eat the sunflower seeds, which gave the educator the opportunity to discuss how the seeds were also used by humans for food. Further sharing also showed that the children were aware that the head of the sunflower follows the path of the morning sun and that it faced east in the morning.

An extension to this activity could be to have the children plant the seeds or look at the painting Sunflowers by Vincent Van Gough to link their experiences through art.

Connecting science and environmental education

Littledyke (1997) commented that, ‘There is a need for an understanding of the relationship between science and environmental education which draws on science to support knowledge of the causes of environmental problems, as well as the complexity of ecological systems’ (p. 641).

In general:
Science is

- seen as a particular way of defining our world
- the gathering of evidence, involving methods of investigation
- socially negotiated explanations
- involved with the use and production of technologies.

Environmental education

- encourages environmentally responsible behaviour
- is about making informed decisions
- has three integrated dimensions (about, for, in) with awareness of cultural, social, political and economic aspects.
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It should be noted that these are not seen as mutually exclusive aspects of either domain.

In this chapter, I have deliberately and purposefully set out to highlight that in many cases the divide often suggested by environmentalists and scientists is arbitrary, at least at the level of young children. In fact, a knowledge of science can increase children’s sensitivity, understanding and appreciation of the interconnectedness of all living and non-living things. This sensitivity then plays out in an environmental awareness that can be linked successfully to environmental sustainability through further education of the social, political and cultural aspects of a situation.

A review of the literature reveals that there is little research in the area of young children’s environmental understandings linked with science. However, there have been some studies undertaken in primary schools with young children (Birdsall, 2007; Lindemann-Matthies, 2002). In her study of 8-year-olds, Birdsall (2007) set up an investigation into children’s understandings of concepts of environmental sustainability. She conducted interviews to determine the children’s understanding of the related science concepts and, using the environment of a local park, set up explorations for children to develop the relevant science understandings in an environmental setting. She also provided opportunities through discussion and role play for the children to develop understandings of environmental sustainability. After their visits to the local park, children’s science and environmental questions were investigated and discussed. At the end of the unit of learning, Birdsall conducted an interview with the children and found that:

- Initially, children had exhibited simple understandings ‘... if they all die, we won’t have so much fresh air and we need fresh air’, whereas at the end, understandings were more complex ‘... putting the rocks to stop avalanching ... so fish can breathe and find their food ... having some native trees ... to make lots of oxygen and for native birds to be around’.

- Increased complexity in understandings was demonstrated as well in their submission to the local council: ‘... how important it is to have shady banks ... For the macroinvertebrates as well as the importance of protecting breeding sites (for native birds). We think that this needs to be taken into account when considering lakeside developments.’

Birdsall (2007) concluded that it is important that children have a strong understanding of the environment and environmental issues and that science can provide deeper understanding of issues when taught in conjunction with the environmental understandings. Environmental education can provide a ‘real-life’ situation or vehicle through which to teach science.

In another study, by Lindmann-Matthies (2002), children undertaking environmental education, whereby they participated in the environment through field trips of outside activities, had enhanced understanding of both biodiversity and environmental issues.
CASE STUDY 8.1

Children had been exploring in the garden and had found some snails. The educator drew their attention to the parts of the animal and questioned them about what they thought the parts were for. She asked the children to show her where they had found the animals and further questioned them about the habitat and what they believed the animals might eat.

One of the children commented on how the snail moved and, after several minutes of observing the snail, the children were trying to run snail races. The teacher then changed the surface of the footpath by wetting it with water and asked the children whether this had any effect on the snail’s movement. Again, there was some close observation of the snails. At that point another child came to watch what was going on, but instead of fixing his interest on the snails, he wanted to know why the water was flowing the way it was. The educator, rather than answer the question, asked him what he thought and received the answer that the water was flowing downhill and there was a slight slope on the path.

Reflection

What was the purpose of all the questions the educator asked?
What aspect of this case study allowed the educator to expand on children’s environmental science knowledge?
How could the educator have extended this activity?

CASE STUDY 8.2

An early childhood educator wished 3-year-old children to gain an understanding that an organism’s structures and behaviours should be viewed in terms of their survival purposes. In undertaking a probing activity with the children, she asked them the question, ‘Why does a frog have webbed feet?’ The children answered:

Child 1: ‘Like my swimming flippers.’
Child 2: ‘Cause they’re Ninja Turtles!’
Child 3: ‘To be like a ducky feet.’
Child 4: ‘For jumping high in water.’

Although Child 1 could equate the frog’s webbed feet to being like flippers and Child 3 exhibited some knowledge about other animals with webbed feet, none of the children really had any idea about the purpose of webbed feet, so the educator chose to run an activity on this topic. Using a large tub of water, the children were instructed to run their hands through the water with their fingers opened. After trying this, the educator asked them to describe the action, asking them whether it was difficult, easy, fast or slow. The task was repeated, but this time the children had placed a plastic sandwich bag over their fingers. They were asked the same questions and the educator prompted a discussion about why they might need the webbed feet for survival.
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Child 1: 'The frog is fast in water 'cos his feet is like the duck.'
Child 2: 'Animals have bad animals coming for them so they have strong body things to go and hide away.'
Child 3: 'I've got flippers so I'm fast like a frog at swimming.'
Child 4: 'Out of the water I think the feet are good at jumping, too.'

Through participating in this simple activity, the children learnt that the webbing on frogs' feet helped them swim and that some animals have different body parts to assist in their survival.

Acknowledgements


Linking to the EYLF

Educators need to work in ways that consider both direct and incidental teaching around various ‘curriculum’ areas, so they need to be aware of how the experiences of children fit into the EYLF (DEEWR, 2009).

Learning Outcome 1: Children have a strong sense of identity

- Children feel safe, secure, and supported – in undertaking their own investigations in the natural world, children interact with their natural environments with assurance.
- Children develop their emerging autonomy, inter-dependence, resilience and sense of agency – in undertaking their own investigations in the natural world, children develop their own sense of agency.
- Children develop knowledgeable and confident self identities – through interacting with others in the natural environment through play, children gain confidence in themselves and others.
- Children learn to interact in relation to others with care, empathy and respect – in shared explorations in natural environments, children learn to interact with others, respect others’ points of view and develop an empathy towards the environment and the part they play in it.

Learning Outcome 2: Children are connected with and contribute to their world

- Children develop a sense of belonging to groups and communities and an understanding of the reciprocal rights and responsibilities necessary for active community participation – sharing with others during explorations.
Children respond to diversity with respect – begin to understand how all things are inter-related and coexist – people, places and other living things.

Children become aware of fairness – share with others, become aware not to take more than allowed when making collections of natural materials.

Children become socially responsible and show respect for the environment – through education, children become aware of pollution and the need to pick up their own litter.

**Learning Outcome 3: Children have a strong sense of wellbeing**

- Children become strong in their social and emotional wellbeing – children are able to make choices to behave in a safe manner.
- Children take increasing responsibility for their own health and physical wellbeing – children are able to move confidently around in the natural environment.

**Learning Outcome 4: Children are confident and involved learners**

- Children develop dispositions for learning such as curiosity, cooperation, confidence, creativity, commitment, enthusiasm, persistence, imagination and reflexivity – children demonstrate an ability to ask questions, to proffer answers and solutions to problems, to undertake their own investigations linked with interest.
- Children develop a range of skills and processes such as problem solving, inquiry, experimentation, hypothesising, researching and investigating – children can identify which leaf belongs to which tree. They can use a number of strategies for categorising or measuring an object's attributes.
- Children transfer and adapt what they have learned from one context to another – children are able to draw or paint what they have seen in an earlier exploration of the natural world.
- Children resource their own learning through connecting with people, place, technologies and natural and processed materials – children use their own resources to gather information about the natural world. They can describe what they have seen and can communicate what is natural and what is human-made.

**Learning Outcome 5: Children are effective communicators**

- Children interact verbally and non-verbally with others for a range of purposes – children can describe their own explorations and that of others. They are able to use dance to, for example, show the movement of a falling leaf.
• **Children engage with a range of texts and gain meaning from these texts** – children can share story books or can use digital photographs to tell their own stories of a visit to a local park.

• **Children express ideas and make meaning using a range of media** – children can create artwork from natural objects or can take photographs of interesting items in the natural environment.

• **Children begin to understand how symbols and pattern systems work** – children can manipulate natural objects to create patterns. They start to understand what the icons on park signs mean.

• **Children use information and communication technologies to access information, investigate ideas and represent their thinking** – children can use interactive computer programs to extend their understandings of the natural environment or computer drawing programs to re-create an image of a natural object.

### Conclusion

This chapter set out to discuss the importance of including environmental activities in early childhood centres, with the aim of enhancing young children's environmental sustainability understandings. Through the interrogation of research, the chapter highlighted the nature and purpose of environmental education in early childhood centres. Pedagogical approaches to the way young children can be provided with explorations of an environmental nature were provided, along with several instances of activities in practice. The chapter then indicated how science and environmental education fit together to develop in young children an empathy for living things, a knowledge of ecosystems and an understanding of the inter-relationships between elements of their environment. Finally, the learning outcomes of the EYLF have been highlighted against specific learning opportunities that could be undertaken within an environmental education program as described in the chapter.

### References


