



# Learning from Trees

Life Lessons for  
Future Generations

national   
tree day

PLANET ARK



TOYOTA





Steve Parish, nature photographer, featured with a mighty Moreton Bay fig. Steve sees trees as teachers who show us that we are continually growing, adapting, and transforming to our environment.

## Foreword

**STEVE PARISH, naturalist, conservationist, award-winning nature photographer and publisher**

For over 55 years, I have been photographing Australia’s landscape driven to ‘show and tell’ the wonders of nature through photography and inspire others to fight for the protection of our unique wild places and creatures. Over my career, I have taken over 500,000 photographs of Australian landscapes, plants, animals and trees, many of which personify qualities intrinsic to the human spirit and are featured in this report.

I see my role as a teacher and environmental education at the very core of my life purpose. As a publisher, I produced hundreds of mass-market, nature, educational titles and an extensive range of children books, both fiction and non-fiction.

In 2011, I lost my publishing company and sadly all my possessions due to the Queensland floods where tens of thousands of dollars of stock and 36 filing cabinets of photos were destroyed. Understandably this was a terrible time for me and I went through a period of depression and anxiety. Nature helped me heal. At times of hardship, I’ve learned to ‘plug-in’ to nature to rejuvenate and recharge. I am now an advocate for improving mental health through nature connection and am an Ambassador for the Mental Illness Fellowship of Queensland, Bush Heritage Australia and Planet Ark.



I have also begun a new company called Nature Connect designed to encourage people to explore Australia’s natural environment through photography and art ([steveparish-natureconnect.com.au](http://steveparish-natureconnect.com.au)). In my opinion, nature connection is the single most important issue of our time. Humans have always been hard-wired to nature; although too many of us see ourselves as separate from the natural world.

Trees are the planetary icon for nature. More than an icon, the tree can also become an anchor in our lives, a life-centre for our mental, spiritual and physical wellbeing. It never ceases to amaze me of the parallels and life lessons we can learn from trees like the tenacity of a windswept tree growing on a cliff top, the resilience and durability of a tree like the Moreton Bay fig with its enormous prop root system or the determination of a tiny seed that grows into a giant ghost gum soaring amongst the tallest trees in the world. Through focus and sheer grit, we too can surmount barriers, break through fears to attain aspirations well beyond our wildest dreams.

**NATURE TEACHES US to grow, adapt and thrive.**



## Foreword

**Dr. Amanda Lloyd**  
**Director Outdoor Connections**

Australian schools are faced with a crowded curriculum and a drive to teach towards standardised tests. This means that timetables are full, expectations for academic attainment are high and the pressure on teachers to deliver highly structured learning programs is overwhelming.

For most children the majority of time at school is spent inside a classroom sitting at a desk. It doesn't have to be this way. All it takes is to think outside the box – no walls needed. Beyond the classroom there is a whole world waiting to be explored. Schools just need to access it.

The recent inclusion of Outdoor Learning in the Australian Curriculum is a leap forward for future nature-based experiences within the school day.

Many years ago, as an experienced primary school teacher, I began taking classes outside the classroom to complete the regular school curriculum. The learning outcomes didn't change, the location did. Standard curriculum subjects were taught in the playground and nearby outdoor spaces.

While academic attainment grew there were myriad other benefits unfolding.

The children learned problem solving as they worked out how to dress for different weather conditions and planned safe

'Think outside the box  
- no walls needed'

walking routes to parks. Working outside, they developed heightened emotional intelligence, interpersonal skills and resilience to overcome challenges. Walking up hills, across uneven ground or learning in the rain was never an issue because the children had developed coping strategies, which transferred to all manner of situations inside and outside the classroom.

Importantly, taking children outside the classroom allows them to engage in awe and wonder. These experiences allow a connection to place to develop and in turn a love of the world to be fostered.

As education writer David Sobel says: "If we want children to flourish, to become truly empowered, then let us allow them to love the earth before we ask them to save it".

When an integrated learning program is developed by teachers and supported by schools we position children to learn in, with and for nature.

As parents, teachers and community members we can support using the outdoors as a classroom. Petition schools to make improvements in their playgrounds so they can become sites of meaningful learning; volunteer to assist at your child's school if they ask for outdoor helpers and to those educators out there; break out of the walls and teach. The world will thank you for it.



**The recent inclusion of Outdoor Learning in the Australian Curriculum is a leap forward for future nature-based experiences within the school day. Dr. Amanda Lloyd (featured) is a pioneer in this field.**





Photo: Steve Parish, National Tree Day Ambassador

**Children need grit, determination, perseverance and resilience to help them persist through hardships, set-backs and weather life's storms.**

## Preface

**KIRRILIE SMOUT, Clinical Psychologist working with children and teens. Director, Developing Minds Psychology and Education**

This research study reveals that teachers believe children most need critical thinking and problem solving, grit and emotional intelligence in order to overcome future challenges.

As a psychologist who has worked with kids and teens for 20 years, I absolutely agree.

Future challenges in our world will be different from what society has encountered in the past. And these challenges will not be solved by following predetermined “rules”. We have all the information we need – but information alone is not going to help us. We are going to need future generations to scan information quickly, try new approaches, think flexibly and independently to create new solutions to new problems in the future.

Future generations are also going to need to persist through hardships, set-backs and struggle to solve these problems. Research shows that people who persist at tasks for longer are more successful at them. Successful problem solving requires concentration and grit.

Finally, in order to solve problems in our future we are going to need to work together, communicate and establish positive relationships. Future generations need emotional intelligence communication skills to be able to co-operate and work together.



**Clinical Psychologist, Kirrilie Smout, works with children who struggle with anxiety, worry, coping with friendships at school, managing frustration, attention or following instructions.**

One of our important tasks in caring for children is to teach them to think critically and flexibly, use strategies to persist and find motivation even when the going is tough and to get better at relating to each other. This is the job of parents and carers, schools and teachers and society as a whole. We will need to give children practice in solving problems, discuss with them how they can persist through hardship and explicitly teach them emotional intelligence skills. We need to talk about these skills when we read with them, get them noticing how they use these skills when they play and model them ourselves in front of children. We need to provide them with play opportunities, conversations and learning environments which reinforce their learning in these areas.

Children with the these skills – problem solving, grit and emotional intelligence – will be happier, healthier and more successful – and a society with children with these skills will solve future problems.





Inner city schools can help children flourish by creating greener outdoor learning environments with plants, vertical gardens and murals of natural landscapes.

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# About this report

For the past six years, in the lead up to National Tree Day, Planet Ark has published reports based on the research it has commissioned exploring Australians' contact with nature.

This report explores the skills and attributes children need in order to help them deal with future challenges. It combines Australian and international peer-reviewed academic research with the results of a snapshot survey of 200 teachers. The survey was designed and commissioned by Planet Ark and conducted online by consultants Kimberlin Education in April 2017.

Previous Planet Ark reports for National Tree Day have covered the dramatic changes that have taken place over just one generation in the way children play and interact with nature, highlighting the physical and mental health benefits for children of contact with nature, and parents' understanding of these benefits. Planet Ark has examined the long-term implications of reduced contact with nature during childhood on the future happiness and wellbeing of today's children, and explored how time in nature can enhance areas of life that Australians are most passionate about: health, happiness, learning, relaxation and relationships.

*"Outdoors" in this report can mean time in the school grounds, a nearby park or nature reserve. It can also include day trips to both urban and rural areas such as farms, rivers, lakes, beaches, National Parks, State Forests, and residential experiences in outdoor learning centres or on overnight and multi-day hikes.*

## Planet Ark

Planet Ark Environmental Foundation is an Australian not-for-profit environmental organisation. Founded in 1992, Planet Ark's vision is to unite people, businesses and governments through positive environmental action. This year marks National Tree Day's 22nd anniversary. Over the years more than 3.8 million volunteers have planted more than 23 million trees, shrubs and grasses across Australia. Proudly sponsored by Toyota Australia, Tree Day is an opportunity to do something positive for your local environment and community and reconnect with nature.

## Acknowledgements

Toyota Australia has been the major sponsor of Planet Ark's National Tree Day since 2000. Toyota provides invaluable on-the-ground support for National Tree Day at local community and school tree planting sites around Australia through its national dealer network and ambassadors. By supporting National Tree Day, Toyota is giving back to local communities and demonstrating its commitment to support sustainability. Planet Ark would like to gratefully acknowledge the funding support of Toyota, the research by Kimberlin Education and report writing by Narrate Media, the advice and editing assistance of Debbie Agnew, Rebecca Gilling, Carol Warwick and Josh Cole of Planet Ark. Research was managed by Sara Mathews from Kimberlin Education and graphic design by Slade Smith.

**Planet Ark and Toyota Australia's research in the area of contact with nature showcases the inestimable value of our relationship with our natural environment and the importance of trees.**

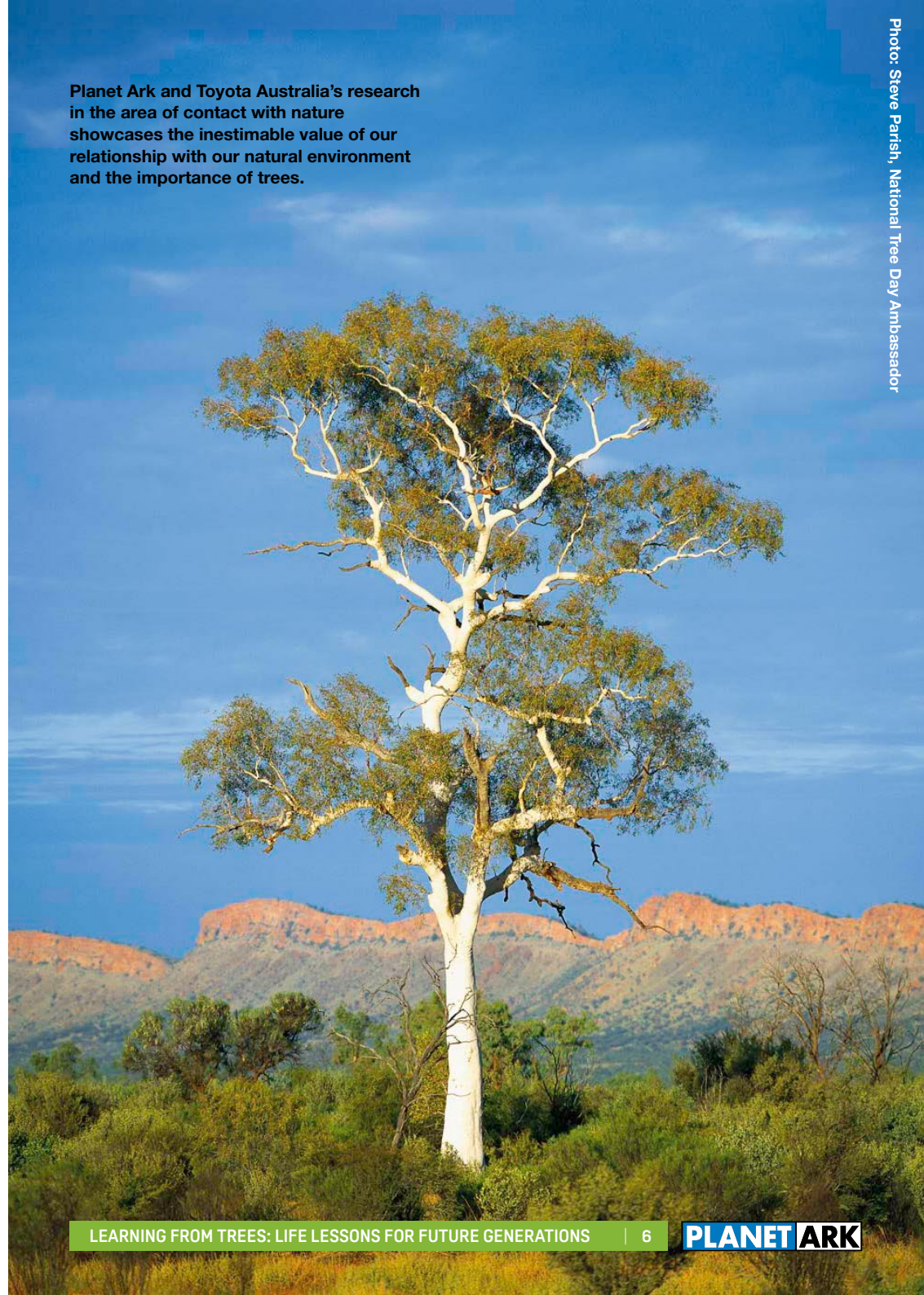


Photo: Steve Parish, National Tree Day Ambassador



# Introduction

Nature teaches us.  
Time outdoors can't  
be downloaded.



The world is undergoing accelerating change. New technology is creating startling opportunities and unprecedented challenges at home, school, in the workplace and wider community<sup>1</sup>. Population growth, use of energy, land and other resources, combined with the transformation of communications and transportation are impacting the planet on a geological scale for the first time in human history<sup>2</sup>.

More and more people are living in cities, adapting their lives to faster and more uncertain economic, social and cultural change. Toddlers are using digital devices. Parents are working longer hours. Heightened fears of child safety, coupled with a pressure to engage in extracurricular activities<sup>3</sup> mean the next generation is losing touch with nature in a way that's never been experienced before<sup>4</sup>.

What are the consequences? Childhood experiences shape our worldview and influence how we behave as adults<sup>5</sup>. Nature sustains us. It elevates the human spirit. It ignites passion, inspiration, creativity and purpose. Nature teaches us. Time outdoors can't be downloaded. Will the next generation value and care for the natural environment if they spend so little time in it?

**How will they cope with the challenges of global warming, the loss of biodiversity, scarcity of resources and the prospect of increasing political instability and conflict?**

There are some grounds for optimism. Around the world, there is a growing understanding of the consequences of this disconnection.

In some countries, this realisation has prompted both teachers and parents to embed time outdoors into children's lives, spurring the rise of projects, networks and curricula focused on getting kids outdoors to engage with nature. Several of these initiatives are highlighted in this report.

According to Planet Ark's survey of 200 primary and secondary teachers, children's strongest attributes are compassion, adaptability, creativity and innovation. These are important skills with which to manage and overcome future challenges.

However, the top skills and attributes teachers say students need are also considered to be their weakest. These are critical thinking and problem solving, grit (determination, persistence and motivation) and emotional intelligence. How can teachers, parents and the wider community do more to equip the next generation with these skills?

**Planet Ark's evidence-based view is that more time in nature would help better prepare children for the challenges they will face.** Australian and international peer-reviewed research, referred to in this report, shows that time in nature not only improves mental and physical health, but also helps nurture the many interrelated soft skills that teachers and others identify as important.

In Planet Ark's snapshot survey of 200 Australian teachers, two in every three survey respondents said they spent the equivalent of 15-minutes or less a week teaching outdoors.

# At a glance

Teachers were asked to rank the following skills and attributes in order of importance:

- STEM skills (science, technology, engineering and mathematics)
- Problem solving and critical thinking
- Creativity and innovation
- Compassion
- Grit (determination, resilience and perseverance)
- Emotional intelligence
- Trade skills

Only 4% of Australian teachers ranked STEM (science, technology, engineering and mathematics) skills as one of the top 3 qualities needed to tackle the world's challenges

60% of teachers ranked critical thinking and problem solving, grit and emotional intelligence as the most important skills for the future

60% of teachers identified these same skills as their students' weakest, with grit being the weakest overall

## Less than 34%

of Australian teachers taught outdoors for 15 minutes or more in a 10-week term (excluding lunch, recess and physical education)

## 4%

of teachers surveyed considered Outdoor Learning as most important for fostering inspiration, creativity and problem solving

## Research shows outdoor learning helps grow problem solving, grit, emotional intelligence and key educational outcomes

The best primary school system in the world is Finland who performs highest on international benchmarks.

Finnish school students spend 15-minutes every hour outdoors

Nature is home to thousands of species, including human beings. It's time to be wise like an owl – the future of the planet depends on it.



COMPASSION ABILITY  
 WELLBEING GENEROSITY CONFIDENCE  
**HEALTH & PHYSICAL EDUCATION**  
 COMPREHENSION VOCABULARY  
 NEGOTIATION OPTIMISM **GRIT** ENJOYMENT MEMORY ENGLISH OUTDOORS  
 PHYSICAL FITNESS PERSEVERANCE RESILIENCE  
**HUMANITIES** MOTIVATION **PROBLEM**  
 NUMERACY CONCENTRATION **SOLVING** CONNECTION  
**CRITICAL THINKING** LITERACY READING  
 VITALITY HOMEWORK EMPATHY ATTENTIVENESS MATURITY  
 SYNTHESISE RELAXATION FOCUS LEADERSHIP  
**THE ARTS** COLLABORATION MENTAL HEALTH FRIENDSHIPS  
 WRITING **EMOTIONAL** INSPIRATION TEAM BUILDING HEALING SCIENCE  
 ENRICHMENT OUTSIDE **INTELLIGENCE** FRIENDLINESS ADAPTABILITY TECHNOLOGY  
 EVALUATION  
**ENGINEERING**  
**MATHEMATICS**  
 CONFIDENCE GROWTH DETERMINATION PRODUCTIVITY PERFORMANCE POTENTIAL COGNITION EXPLORATION  
 COMMUNICATION EDUCATION ATTENTION OUTDOOR RECREATION KINDNESS HAPPINESS CREATIVITY  
 LANGUAGES INTERPRETATION NATURE GROUNDING HOPE CALM PLAY LOGIC HEALTH ANALYSE  
 PURPOSE STILLNESS **OUTDOOR** FOCUS SELF-ESTEEM  
 LEARNING CONNECTION PASSION PRIDE JOY  
 OBSERVATION RESPONSIBILITY THRIVE  
**AUSTRALIAN CURRICULUM**

Think Outside the Box – Outdoor Learning Can Grow So Much

Outdoor learning was introduced as part of the Australian Curriculum in 2015



# Future challenges

The United Nations has identified a number of interconnected challenges facing the world<sup>6</sup>, with climate change chief among them. From shifting weather patterns that threaten food production, to rising sea levels and biodiversity, climate change impacts are global and unprecedented. The Australian government said in 2010 that this nation will be one of the countries hardest and fastest hit by climate change, threatening economic sustainability<sup>7</sup>.

Other global challenges include:

- **Food:** One in nine people does not get enough food to lead an active life. Hunger and malnutrition are the biggest health risks worldwide.
- **Water:** Although Earth has enough fresh water for everyone, millions die each year from diseases associated with inadequate sanitation and hygiene.

- **Refugees:** The world faces the highest level of forced displacement ever recorded. War, climate change, starvation and other factors have forced 60 million people from their homes.
- **Population:** Since 1950, the world population has almost tripled to an estimated 7.5 billion. In Australia, population ageing is a particular concern, another long-term trend that could lead to severe social and economic stresses as proportionately fewer people of working age support more older Australians<sup>8</sup>.

These challenges – so-called megatrends – are predicted to intensify and, according to UN Secretary-General António Guterres, are increasing competition for resources, heightening tensions and instability. UN member countries adopted 17 Sustainable Development Goals in 2015. They include zero hunger, no poverty, quality education, gender equality, climate action, affordable



clean energy, peace, justice and strong institutions. The aim is to achieve these goals by 2030<sup>9,10</sup>.

Preparing the next generation with the skills to deal with these challenges is critically important. By 2030, many of the children at primary school in Australia today will be at university or college, in the workforce or looking for work. Some may even be in leadership roles.

The investment by parents, teachers and the wider community in their health and well-being will profoundly affect how this next generation of citizens deals with the challenge of ensuring future security and prosperity – for Australia and the rest of the world.

**The United Nations has identified a number of interconnected challenges facing the world with climate change chief among them. Preparing future generations to deal with them is critical.**



# The threat of climate change and global warming is real

From shifting weather patterns that threaten food production, to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global in scope and unprecedented in scale.

**Research from NASA**, Vital Signs of the Planet, a report on climate change and global warming, states:

- Carbon dioxide levels in the air are the highest they've been in 650,000 years.
- 16 of the 17 warmest years on record occurred since 2001.

[www.climate.nasa.gov](http://www.climate.nasa.gov)



**Magdalena Roze, meteorologist, celebrity weather reporter and Planet Ark National Tree Day Ambassador, claims climate change is no longer a prediction - we are already experiencing it.**

## Climate change impacts all of us from the planet to the plate

**MAGDALENA ROZE, meteorologist, celebrity weather reporter and Planet Ark National Tree Day Ambassador.**

Climate change is no longer a prediction, we are already experiencing it and living through the effects, especially when it comes to extreme weather like bushfires, heatwaves and rain events. I have reported on these events and seen the devastation first hand to people, landscapes, livelihoods and nature. Our lives and lifestyles are already being impacted. The weather has and always will be volatile, that is the nature of the weather. But humans are shifting the energy balance to a dangerous level whereby, as one farmer told me, "the weather is forgetting itself." The responsible thing to do is change our behaviour now.

Working on the cookbook *Planet to Plate* also gave me an insight into the very real and damaging effect that warning temperatures are already having on crops and farmer's livelihoods. We're so lucky to grow some of the best food in the world but the diversity of this produce is already starting to dwindle. There are varieties and species of food that are at risk of being wiped out completely.



**SEAN O'MALLEY, Head of Research for Planet Ark.**

Sean has a PhD in behavioural ecology with training across the earth and life sciences. Since 2007 Sean has been providing the research that underpins the Planet Ark campaigns.

According to CSIRO, Australia's changing climate represents a significant challenge to individuals, communities, governments, businesses, industry and the environment. Australia has already experienced increases in average temperatures over the past 60 years, with more frequent hot weather, fewer cold days, shifting rainfall patterns and rising sea levels.

Scientists at CSIRO working with the Bureau of Meteorology have modelled future projections for the impact of climate change for Australia <sup>56</sup>.

Many of the changes we have already experienced will continue:

- hot days will become more frequent and hotter
- sea levels will rise
- oceans will become more acidic
- snow depths will decline and
- extreme rainfall events are likely to become more intense



## Teachers identify top skills needed

Research shows that parents and teachers are pivotal in helping children develop the skills they need to overcome future challenges. These include resilience, self-awareness, the ability to identify and recognise their strengths, maintain self-confidence and regulate their emotions to handle stress, overcome obstacles and achieve personal and academic goals. They can also help children develop social awareness, relationship skills and responsible decision-making<sup>11,12</sup>.

In April 2017, Planet Ark commissioned consultants to conduct a survey of 200 teachers. The survey asked what they considered to be the most important skills their students need in order to face future challenges, and to assess their preparedness.

The survey indicated that children need to work on developing three core skills: grit – their weakest attribute – critical thinking, and emotional intelligence.

- More than half (53%) of teachers ranked the strongest attribute students already have as either compassion (20%), adaptability (17%), or creativity and innovation (16%)
- Three out of five ranked either critical thinking and problem solving (24%), grit (19%) or emotional intelligence (17%) as the top skill or attribute students need

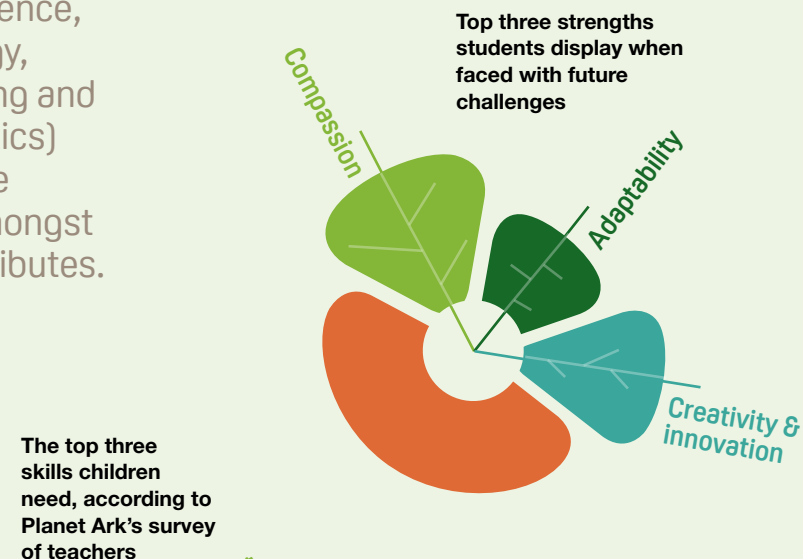
- Three out of five respondents ranked either grit (28%), critical thinking and problem solving (21%) or emotional intelligence (12%) as students' weakest attributes.

Teachers also highlighted the interconnectedness of these elements. They specifically identified grit (determination, persistence and motivation) as impacting on a student's ability and desire to think critically and problem solve. One is not possible without the other.

**Australian teachers indicate that children need to work on developing three core skills: grit – their weakest attribute – critical thinking and emotional intelligence.**



STEM (Science, Technology, Engineering and Mathematics) ranked the lowest amongst all the attributes.



**The three weakest attributes of children when faced with future challenges**

- Other:**
- STEM skills (Science, Technology, Engineering and Mathematics)
  - Creativity and innovation
  - Compassion
  - Trade skills





# Green time not screen time

In his seminal book, *Last Child in the Woods*<sup>13</sup>, American author Richard Louv brought together international research to show that nature is vital to a child's healthy emotional, physical and spiritual development. Louv's book argued that nature is a strong antidote for depression, obesity, and Attention Deficit Disorder. He coined the term "nature-deficit disorder" and spawned an international movement to reintroduce children to nature.

In 2014, Louv's Children and Nature Network foundation provided support to 369 grassroots campaigns worldwide, connecting more than 3.5 million children to nature experiences<sup>14</sup>.

Planet Ark's evidence-based view is that more time in nature – and less time indoors on digital devices – helps better prepare children for the challenges they will face in this rapidly changing world. Both teachers and parents have an important role to play in encouraging this.

Australian and international peer-reviewed research, referenced in this report, shows time in nature not only improves mental and physical health, but also helps nurture the interrelated soft skills that teachers and others identify as important.

**Research shows that more time in nature – and less time indoors on digital devices – helps better prepare children for the challenges they will face in this rapidly changing world.**



## European initiatives

In many European countries, learning outdoors is no longer considered a peripheral activity because of its widely accepted benefits for academic performance, social interaction and overall health.

In Scotland, for example, teaching outdoors has moved from inhabiting a supporting or “extra-curricular” role in the last decade, into a mainstream, core curricular position<sup>15</sup>. Researchers found that between 2006 and 2014 teachers had increased their time teaching in green areas such as parks, gardens, wildlife areas and woodlands.

In Finland, until high school, children must spend 15 minutes, every hour, playing outdoors – whatever the weather. (An oft-repeated saying in Scandinavian countries is that “there is no bad weather only bad clothing”). Researchers identify outdoor learning as an important element in Finland’s successful development of the best primary school system in the world, performing highest on international benchmarks<sup>16</sup>.

Three other Scandinavian countries have words that roughly translate as “school-based outdoor teaching in the local outdoor environment as an integrated part of the school system”. In Danish it’s known as *udeskole*. In Swedish it’s *utomhuspedagogik* and in Norwegian it’s *uteskole*.

In Norway, outdoor teaching is part of the curriculum, while in Denmark it evolved as a grassroots movement among teachers that has spread to cover almost the entire country<sup>17</sup>.

**Australian schools are starting to model international schools such as Finland, where school children must spend 15-minutes, every hour, playing outdoors – whatever the weather.**

In these countries, outdoor learning is a regular, compulsory activity for children aged 7 to 16 years and is often inter-disciplinary. It takes place in a cultural or natural setting, and might include measuring and calculating the volume of trees in mathematics, writing poems in and about nature for language classes or assessing, sketching or photographing places of historical significance.

## Australia catching on

Australian educators, teachers and parents are paying attention to global trends in outdoor play, and are taking steps to redress the imbalance. Some states have adopted regional initiatives. In Queensland, Nature Play QLD is inspired by the ideas of Richard Louv<sup>18</sup> and the Children & Nature Network he helped found. It is run by the Queensland Outdoor Recreation Federation and supported by the Queensland Department of National Parks, Sport & Racing.

Nature Play WA is an initiative of the Western Australian Department of Sport and Recreation to raise awareness of the benefits of outdoor play and provide resources for





families and teachers to facilitate nature play<sup>19</sup>. These resources include cubby-building workshops and a directory of 44 family nature clubs across the state. For schools, Nature Play WA provides a range of lesson plans that include innovative ideas such as going on a massive outdoor treasure hunt (aka geocaching) and stream playing.

In South Australia, playing outside is also a significant priority for the state's Department of Education and Child Development. They are in the process of creating 20 purpose-built outdoor learning areas across the state to benefit families and teachers<sup>20</sup>.

Victoria has created the Kids in Nature Network which connects individuals, families and organisations involved in health, education, environment, outdoor, recreation, research and the arts promoting nature play to improve children's health<sup>21</sup>.

The Duke of Edinburgh's International Award is open to all Australians aged 14–25 regardless of their location or personal circumstances. The Award is designed to better equip participants for life and work. A key part of the program is an 'adventurous journey', in which young people 'discover a spirit of adventure and gain a deeper understanding of the environment and the great outdoors'. The results of a pilot study conducted by Western Sydney University showed measurable improvements to participants' self-confidence, ability to cope with change (resilience), leadership, overall effectiveness and active involvement that could be directly attributed to their participation in the Award<sup>22</sup>.

At a Catholic school in Nowra, a regional NSW coastal town 160 kilometres south of Sydney, researcher Dr Amanda Lloyd and one of the school's teachers conducted a study of primary school children.

Following a place-based outdoor learning method and practice, influenced by the Danish model of *udeskole*, the teacher taught her class of 27 year-one children outdoors for a half or full day every week for the whole school year<sup>23</sup>.

As they went out in the school grounds and nearby parks, the children (aged six years old) wore GoPro cameras to record their reactions and interplay with others. Lloyd also interviewed, videoed and photographed them.

Their teacher taught English as the core outdoor lesson, and incorporated geography, art and science into the mix – all fitting into the required Australian curriculum.

The children role-played, made maps, constructed scenes for storytelling, wrote in nature journals, took photographs, went on bushwalks and made art from found objects.

"The big thing was that they developed a sense of connection; to their playground and to the parks we visited. They really noticed little details like a bee or a particular flower," Lloyd observed<sup>24</sup>.

They also connected differently with each other. Outdoor learning transformed friendships between the students. Some students who had been shy and quiet indoors became leaders outside.

Lloyd assessed the students' academic results across key learning areas, discovering that their learning had expanded dramatically; every child increased their vocabulary and writing ability noticeably.

Their reading and skills attainment improved well above the normal level, even considering the time spent out of the traditional classroom.

"Some children who were reluctant writers, recorded their outdoor experiences readily after the stimulation outdoors."

"They were much more motivated to learn, especially because everything they did involved real life examples and tangible events."

"The outdoor learning and sense of place has now become a part of who they are."



An Australian study on primary school children assessed the positive influence of outdoor lessons on students' academic results, particularly vocabulary and writing ability.

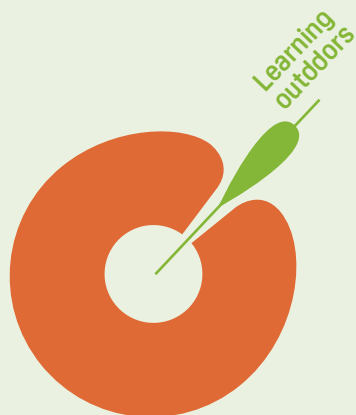


## Barriers to outdoor learning

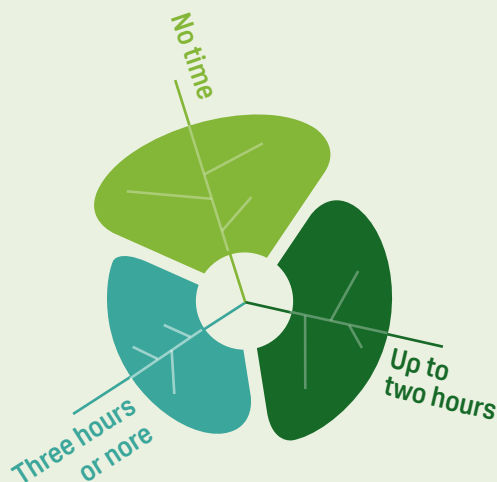
Planet Ark's survey suggests that many Australian teachers are spending little time outdoors teaching their students – even though many understand and appreciate the benefits.

- Two in every three respondents in the survey of 200 teachers said they spent the equivalent of 15 minutes or less a week teaching outdoors.
- Almost one in three respondents (28%) said they spent no time teaching outside at all.
- Even though teachers teach outdoors for a limited period, they identified the top two benefits as fresh air (19%) and a change in environment (16%). Some of the teachers commented that fresh air – as opposed to hot classrooms – fuels and clears children's minds, helps them to focus and stimulates their brains.
- Fewer than 10% of teachers stated that learning outside created a stimulating environment and they didn't rate the opportunity for freedom of movement, physical wellbeing or disengagement from technology very highly.

Many teachers don't venture outside because they feel constrained by having to fulfil all the requirements of the Australian Curriculum and standardised tests. Teachers are also burdened by complying with the risk assessment of potential outdoor activities. Some researchers are optimistic



**Just 4% of teachers listed outdoor learning as most important for fostering inspiration, creativity and problem solving.**



**Two in three teachers reported spending less than two hours teaching outdoors in a 10 week term.**



**Just 4% of Australian teachers surveyed listed Outdoor Learning as the most important skill for developing inspiration, creativity and problem solving. It's time to think outside the box Australia.**

that with their school's support and targeted professional development, teachers could be empowered to use their teaching skills outdoors more often and for longer periods<sup>25</sup>.

The Planet Ark survey asked teachers what they saw as the major barriers to teaching outdoors and to rank those barriers in importance. Overall, teachers responded that insufficient infrastructure was the top barrier (18%), followed by not having enough time or facing timetable issues (16%),

followed by the weather (14%). The study was conducted in April.

Primary and secondary teachers had quite distinct responses. Almost a quarter of primary school teachers ranked "not having enough time" or "timetable issues" as the biggest barrier to teaching outside. Conversely, nearly one in five secondary teachers said that the biggest barrier to teaching outside was that the outdoor location was not relevant to their subject matter.





# Nature time helps nurture skills and connection

There is an array of research from Australia and around the world that shows how more time outdoors helps children live healthier, happier and more connected lives. A review of literature from the 1970s to 2015 concluded that the benefits of nature contact for children include better physical health, cognitive functioning and self-control, psychological wellbeing, affiliation and imaginative play. It also developed kids affiliation with other species and the natural world<sup>26</sup>.

So, time in nature could be an important component in the development of specific skills that teachers in the Planet Ark survey identify as weakest in their students, but most important for those students to overcome future challenges: grit, critical thinking and emotional intelligence. These are examined in more detail below.

**The benefits of nature contact for children include better physical health, cognitive functioning and self-control, psychological wellbeing, affiliation and imaginative play.**



## Grit: students' weakest attribute

Grit means different things to different people. It encompasses the tenacity to have a go at a difficult task and the determination to complete it, to keep practising a tricky skill and stick to a passion even when things don't go well. Grit also includes the notion of resilience, the attribute that enables people to recover from adversity and take on the next challenge.

In research published more than a decade ago, American psychologist Angela Lee Duckworth in *Grit: The Power of Passion and Perseverance* and others drew attention to the importance of grit, which they identified as a combination of passion and perseverance required to succeed at long-term goals<sup>27</sup>. Gritty individuals succeed even when they aren't the most talented, and persist in the face of obstacles.

Following Duckworth's 2013 TED talk (which has been viewed more than 10 million times) and 2016 book<sup>28</sup>, grit became a buzzword in educational circles worldwide. Her advocacy has generated awareness and controversy<sup>29</sup>, so perhaps it's not surprising that more than one in four teachers (28%) identified grit at the top of students' weakest attributes in Planet Ark's Survey.

Research suggests that time in nature helps children develop grit, and especially resilience. Studies have shown a correlation between

connection to nature and psychological resilience<sup>30</sup>, leading to recommendations that schools create experiences where children can develop a sense of being part of the natural world.

The outdoor environment often provides a more challenging place for children, according to Australian researcher Amanda Lloyd. Provided they have permission, and adequate supervision, children can assess and take manageable risks, develop skills specific to their lives, interests and talents and engage in activities and increasingly complex tasks with greater enjoyment and proficiency<sup>31</sup>. Other researchers link time outdoors with "fun, mastery and control, confidence, and satisfaction,"<sup>32</sup> all of which help children develop grit.

**Time in nature  
helps develop grit  
(tenacity, resilience,  
determination and  
perseverance).**





## Critical thinking and problem solving



Students develop critical thinking by learning how to analyse, evaluate, interpret and synthesise information using creativity and logic. They also discover how to form an argument and reach a conclusion. This enables them to question evidence and assumptions, identify themes and patterns and look at problems from multiple perspectives. While critical thinking is important for academic success, it also equips students to face the major challenges of our time<sup>33</sup>.

One in four teachers in the Planet Ark survey chose “critical thinking and problem solving” as the most important attribute students need to face future challenges. They also identified it as one of their students’ weakest attributes.

**Students develop critical thinking by learning how to analyse, evaluate, interpret and synthesise information using creativity and logic.**

Only one in twenty teachers thought that spending time outdoors developed these skills. Yet researchers have found a distinct link between time spent outdoors and the development of cognitive ability.

In Britain, after a period of outdoor lessons, researchers found students performed better in reading, mathematics, science and social studies and showed greater motivation for studying science<sup>34</sup>. In a German study, students aged nine to eleven who had gone outside the classroom to learn about amphibians, performed significantly better in achievement tests. Students were also more interested, had a higher sense of wellbeing and felt less anger, anxiety, and boredom doing the lesson<sup>35</sup>.

Californian students who had studied outdoor science improved their test scores by 27%<sup>36</sup>. A Spanish study of students who had green spaces around their school found that over a 12-month period the students’ “memory improved and their inattentiveness reduced”<sup>37</sup>.

Importantly, outdoor learning is more vivid, engaging and interesting<sup>38</sup>. Students feel freer, less hampered and stymied, which can empower them to assess things differently. They can also better understand the relevance of their learning in real-world problem solving by seeing its practical application – such as planting a seed and monitoring its growth.

**‘Outdoor learning is more vivid, engaging and interesting.’**

Mike Fairclough, the principal of West Rise Junior, a government-funded primary school in Eastbourne in southern England, has taken outdoor learning to a whole new level. He believes teachers cannot build a child’s character by sitting them behind a desk all day: “they need to be challenged mentally and physically in an expansive way” and that means getting them outdoors.

On the adjoining paddock to his school is an area called the Marsh, where his students tend half a dozen water buffalo, eight beehives, four turkeys, one goat and twelve sheep. Students learn how to shoot (with rifles), skin and eat feral rabbits that they cook on campfires they build themselves<sup>39</sup>. The Marsh is the second largest Bronze Age settlement in Europe, and teachers use it to teach maths, science and ancient history. The children are also constructing a replica Bronze Age village.

This outdoor learning has paid off. In 2015, West Rise Junior won the Times Educational Supplement’s Primary School of the Year<sup>40</sup>. The school ranked in the top 5% nationally of student achievement tests<sup>41</sup>.



## Emotional intelligence

Emotional intelligence is a term first coined more than 50 years ago and later popularised in a book by the same name<sup>42</sup>. Psychologists define emotional intelligence as the ability to have empathy and an understanding of the emotions of others and communicate effectively<sup>43</sup>.

While some researchers debate whether emotional intelligence in children is a predictor of leadership potential, or if personality characteristics are more significant<sup>44</sup>, others maintain emotional intelligence, along with grit and resilience, is important to enable adults to cope with highly stressful situations, as well as face the global challenges of our era<sup>45</sup>.

Combining emotional skills with intelligence, people can enhance interpersonal awareness and harness emotions to apply them to tasks such as critical thinking and problem solving.

In the Planet Ark Survey, teachers identified emotional intelligence as the third most important skill and attribute students need to overcome future challenges. They also said it was currently students' third weakest attribute.

Outdoor learning often involves collaboration with other students and this gives them the opportunity to practise and develop their emotional intelligence.

A combined Australian and British study that analysed over one-hundred peer-reviewed research papers globally found that children learning outside the classroom achieved

**Outdoor learning often involves collaboration with other students and this gives them the opportunity to practise and develop their emotional intelligence.**

higher scores in class tests, had greater levels of physical fitness and motor skill development, increased confidence and self-esteem, showed leadership qualities and were more socially competent and environmentally responsible<sup>46</sup>.

Even when students are not required to work in a group, research shows that spending school time outdoors increases social interaction<sup>47</sup>. Children still learn how to build relationships, trust each other, gauge others' emotional reactions to different situations and modify their behaviour, whether they are reading out dialogue in a play or doing an art assignment using found objects.



When put in situations with others of different experience, ability and maturity – and even age – students have to figure out how to get along and co-operate<sup>48</sup>. By collaborating, students can work through a task, create a sense of group responsibility and take pride in the results when they do<sup>49</sup>. The process is smoother with less conflict when buttressed by evolving or established emotional intelligence of the participants.

When parents and carers take their children outdoors they can improve their emotional intelligence and increase everyone's happiness. The 2015 Planet Ark National Survey<sup>50</sup> showed that people who rated themselves as 'high' on the subjective

happiness scale had engaged in one third (31%) more activities outside each week as children, compared to people who rated themselves as 'low' on the subjective happiness scale. People with a high connection to nature are also more likely to feel passionate about their relationships with family and friends compared to people with a low connection to nature<sup>51</sup>.

Heikki Happonen, head of the University of Eastern Finland's teacher training lab school, says time outdoors helps children's brains work better. They concentrate more in class and are better at "negotiating, socialising, building teams and friendships together."<sup>52</sup>



# Learning outdoors – a quick guide



## Teachers:

Planet Ark works with Cool Australia, a not-for-profit organisation that provides curriculum support to early learning, primary and secondary teachers. Together they have developed resources to assist teachers with lessons outdoors and achieving the required outcomes of the Australian Curriculum. Here is a small selection of some inspiring outdoor lessons<sup>53</sup>:

- At a **Kindergarten** level, students can learn about the value of trees, discover the names of their parts and how trees function. Inspired by the book *Leaf Man* by Lois Ehlert, (Harcourt, 2005), they can then make their own leaf men with fallen leaves.
- At a **Year 1-2** level, students can learn how to identify, tally and graph wildlife they find in the school grounds. By observing natural habitats, they can reflect on what would be different without trees.
- At a **Year 3-4** level, students can consider how we see and use trees, and how nature features in poetry to show conservation messages. After reading Shel Silverstein's book *The Giving Tree* (Harper and Row, 1964) and then spending time outside in the school grounds, students can brainstorm verbs, nouns and adjectives inspired by nature. Then they use these words to write a poem about trees for a targeted audience.
- At a **Year 5-6** level, students can observe and evaluate natural landmarks in their immediate outdoor environment in their school grounds and use grid referencing





01 Outdoor Learning – Tree Tally – Year 7



02 Outdoor Learning – Angles In The Trees – Year 7



03 Outdoor Learning – Classification of Living Things – Year 7



04 Outdoor Learning – Dichotomous Keys – Year 7



05 Outdoor Learning – Topsoil Testing – Year 8



06 Outdoor Learning – Conservation Careers – Year 8



07 Outdoor Learning – Perimeter And Area in The Schoolyard – Year 8



08 Outdoor Learning – Biodiversity Index – Year 8



09 Outdoor Learning – Ecosystem Connections – Year 9



10 Outdoor Learning – Schoolyard Ecosystem Sampling – Year 9



11 Outdoor Learning – Mini-beasts Maths – Year 9



12 Outdoor Learning – What Do You See? – Year 9



13 Outdoor Learning – Build a Biosphere – Year 10



14 Outdoor Learning – Outside With Perimeter, Area And Volume – Year 10



15 Outdoor Learning – Climate Change in the School Yard – Year 10



16 Outdoor Learning – Census or Sample? – Year 10



**Words out. Research shows outdoor learning enhances vocabulary, reading, writing, and communication skills.**

For the month of July take students outdoors to learn. Planet Ark and Tree Day partner, Cool Australia, have created over 150 curriculum-aligned lessons just for Schools Tree Day & Outdoor Learning.



coolaustralia.org

and mapping skills to design “a secret garden”.

- At a **Year 7** level, students can learn how to investigate, estimate, identify and classify angles in the outdoors in a real world environment, as a preliminary step for geometry.
- At a **Year 8** level, students can investigate the role of topsoil and its importance for food production and biodiversity. They test topsoil around their school grounds and then create a map of topsoil quality at their school so they can make suggestion for improving its quality.

- At a **Year 9** level, students can learn about the structure of ecosystems, including the food chain and the involvement of living and non-living organisms by observing and assessing their school grounds’ ecosystem. This is reinforced with an excursion to a wetland ecosystem.
- At a **Year 10** level, students can identify aspects of biodiversity in their school grounds and research how climate change could affect it.
- At a **Year 8-12** level students can participate in the Duke of Edinburgh’s International Award.



## Parents and carers:

In tandem with teachers, parents and carers can also encourage their children to go outdoors by doing activities with them<sup>54</sup>. Some ideas to get involved in include:

- Climbing a tree
- Playing street cricket
- Riding a bike
- Going for a bushwalk
- Swimming at the pool or beach
- Camping in the backyard (or a National Park)
- Doing some gardening
- Watching a sunset
- Walking the dog
- Taking ordinary indoor activities outside<sup>55</sup>:
- Doing homework outside – laptops are made to be portable
- Walk to school or get off a few bus stops early instead of driving
- Taking board games, arts and crafts, puzzles or toys into the garden or a local park
- Eating outdoors, or having a picnic

To interact with other families outdoors, they can also join organised activities such as:

- Girl Guides [www.girlguides.org.au](http://www.girlguides.org.au)
- Junior Landcare [landcareaustralia.org.au/junior-landcare/](http://landcareaustralia.org.au/junior-landcare/)
- Local community gardens [www.communitygarden.org](http://www.communitygarden.org)
- Scouts [www.scouts.com.au](http://www.scouts.com.au)
- Nippers [www.surflifesaving.com.au/get-involved/nippers](http://www.surflifesaving.com.au/get-involved/nippers)



**Time in nature spent together with family is meaningful as it strengthens relationships.**





# National Tree Day: the ultimate nature fix

Take part in National Tree Day and experience the ultimate nature fix. Each year over 300,000 Australians help to promote a healthy planet by planting trees, conducting bush regeneration and getting green in their homes, schools and workplaces. These simple acts help nature and have positive benefits for the individuals, families and communities involved.

→ [Find a National Tree Day event](#) near you and join over 4 million Australians who have been reaching their potential with nature for the past 22 years.

**Schools Tree Day and National Tree Day are great ways to get your Nature Fix. They take place every year on the last Friday and Sunday in July, so mark your calendar!**



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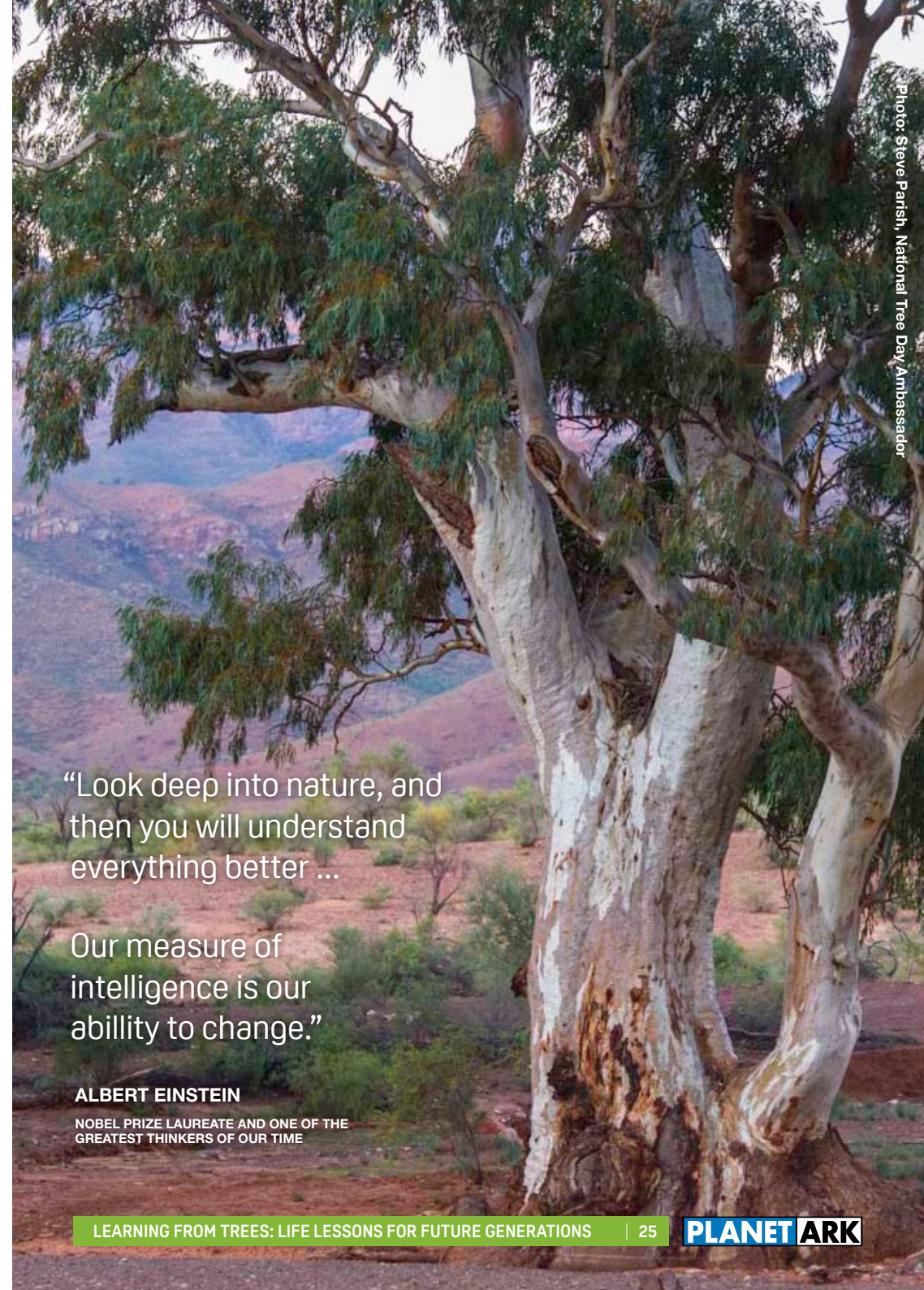


Photo: Steve Parish, National Tree Day Ambassador

“Look deep into nature, and then you will understand everything better ...”

Our measure of intelligence is our ability to change.”

**ALBERT EINSTEIN**  
NOBEL PRIZE LAUREATE AND ONE OF THE GREATEST THINKERS OF OUR TIME