

ADDING
Trees

A PRESCRIPTION

FOR HEALTH, HAPPINESS
AND FULFILMENT

national
tree day

PLANET ARK



TOYOTA

A research report commissioned by Planet Ark and sponsored by Toyota Australia.

FOREWORD

Take Ten to Grow

Twenty one years ago Planet Ark established National Tree Day as a positive, community-based activity to bring native trees back to the Australian environment.

I remember it well. My daughter Gabby and I planted trees on Planet Ark's first National Tree Day and we've done so every year since. These shared experiences remain amongst our most treasured memories.

Over those 21 years nearly 4 million people have planted over 22 million trees, shrubs and grasses and have created wonderful memories of their own. This has been made possible through the active participation of schools, councils, land-care groups, nurseries and community groups like Scouts, Guides and faith communities.

Trees are truly amazing. They produce oxygen, filter the air, remove carbon from the atmosphere, stabilise soil, provide food and shelter for animals, beautify neighbourhoods and, when responsibly harvested, provide the only major building material that helps address climate change. These largely environmental reasons were the driving force behind National Tree Day.

A few years ago we were looking to ensure National Tree Day retained its importance to the many people who had participated in it to that point as well as to ensure it had an important message for the future. It was at this stage that we came across an emerging body of information that showed the human benefits of contact with trees and nature.

This research showed that in the space of a single generation kid's play moved from outdoors to indoors, the iconic backyard shrunk, parents became increasingly anxious about children's safety, working hours and stress levels rose and technology (especially screens) encroached into almost all areas of our lives.

Since 2011 we, with support from Toyota, **have commissioned and released six reports (including this one)** examining these emerging issues and showcasing how increased nature time can help address them. Collectively our reports show that nature is a prescription for addressing many of maladies created by a range of seismic social changes.



"My daughter Gabby and I planted trees on Planet Ark's first National Tree Day and we've done so every year since."
Paul Klymenko, Planet Ark CEO.

Just some of the benefits of contact with nature: children who learn outdoors do better on standardised tests, kids with ADHD experience fewer symptoms when outside, workers with plants on their desks feel less fatigued, and residents of green neighbourhoods exercise more.

As a society we are increasingly aware of the problems associated with our technologically-connected indoor lives as well as the benefits of getting outside (or bringing the outdoors inside). It's time to turn this knowledge into action.

One of the many positive findings included in this report is that just 10 minutes outside is enough to lower blood pressure. It's not hard, even in our busy lives, to find 10 minutes to spend on improving our wellbeing. Getting off the bus a stop or two early, parking the car and walking the kids the last few blocks to school, eating lunch in the park or dinner in the yard, taking the laptop onto the balcony to do some work are all simple actions that can have a positive impact.

Then on National Tree Day join my family, Toyota Australia and many thousands of other Australians to get outdoors and find that nature truly helps us all grow healthier, happier, brighter, calmer and closer.

Paul Klymenko

CEO

Planet Ark Environmental Foundation

FOREWORD

Benefits of Human-Nature Connection

In the words of the renowned philosopher Henry David Thoreau, 'We need the tonic of wilderness'.

And yet, in the 21st Century, we find ourselves increasingly without this 'tonic', or what Richard Louv (2011) calls 'Vitamin N' (for 'Nature'). All available evidence suggests that Australians are becoming less likely to engage with outdoor environments (Maller & Townsend, 2006).

In part, our nature-estranged lifestyle can be directly related to our over reliance on screen time over green time. Our choice of indoor, sedentary hobbies, tethered to screens and electrical outlets (like computer games, Wii, Nintendo, iPads, social media, or television) is inextricably linked to the problem.

In this same vein, esteemed nature writer David Orr argues: "The message is urgent: unplug, boot it down, get off-line, get outdoors, breathe again, become real in the real world".

The relationship between the outdoors and growth and education has been recognised for centuries. The German term 'kindergarten' means literally, 'children in the garden'.

We now recognise the importance nature connectedness as a determinant of health and wellbeing. Scandinavian educators have long recognised this connection, and they immerse children in nature. Students spend approximately three hours each school day outside – rain, hail, snow or shine – in all four seasons. In spite of their harsh climate, educators argue there is no excuse for children staying indoors; as one educator told me recently, 'there is no such thing as bad weather, only bad clothing.'

This begs the question, why does the Australian curriculum have a growing aversion to taking kids outdoors, especially in our mild climate and an endless landscape of possibilities? Louv (2011) argues that as leisure time moves indoors children need a healthy dose of Vitamin N in the curriculum.

The result is that some children are becoming outdoor illiterate. Due to the inordinate time spent indoors on level floor surfaces, for example, outdoor educators are finding that Australian children cannot walk confidently and



We now recognise nature connectedness as a determinant of wellbeing.

skillfully in outdoor environs; they are unfamiliar with uneven ground, crossing rivers or negotiating steep hilly terrain (Stone, 2009).

Nature and Wellbeing

The therapeutic role of nature has been documented as far back as classical Chinese and Greek civilizations (Townsend & Weerasuriya, 2010). Cultures around the world have an intuitive sense that natural environments possess restorative power; we know that outdoor settings ameliorate stress, improve mood, enhance coping ability and assist in combating depression (Nielsen & Hansen, 2007). Ironically, relaxation tapes provide artificial analogues of bird song, babbling streams, or waves crashing on the sand because we insulate ourselves from precisely these sensations.

Recently, in Victoria we have seen the advent of 'Feel Blue: Touch Green,' an innovative mental health program using green spaces to address depression and mental illness (Townsend, 2006). This novel program is based on the extant literature that reveals our separation from nature is implicated in declining physical, mental, social and spiritual wellbeing.

We need to develop an affinity with nature whilst also promoting access to outdoor environments. Now more than ever, we should be ensuring that Australians get their daily recommended allowance of vitamin N for health, happiness and fulfilment.

Associate Professor Tonia Gray

Centre for Educational Research,
Western Sydney University



Nature makes us healthier, happier, brighter, calmer and closer.

About This Report

This report explores how time in nature can enhance and grow fulfilment in the five key areas of life that Australians are most passionate about: health, happiness, learning, relaxation and relationships. The findings of a new Planet Ark National Survey, results from recent national and international peer-reviewed studies and previous Planet Ark research are presented to show that doctors and scientists agree: nature makes us healthier, happier, brighter, calmer and closer.

The National Survey included in this report was designed and commissioned by Planet Ark and conducted online by research consultancy group Pollinate in March 2016. The survey of 1,012 people aged 14-64 years is nationally representative in terms of age, gender, household income and residential distribution. The survey used the well established nature relatedness scale (NRS)¹ to measure the

connection to nature of participants, as was used in the 2015 Planet Ark report². Participants were scored based on their level of agreement with a series of statements, and allocated to a high, medium or low group for their connection to nature.

For the past five years Planet Ark has commissioned research and released reports in the lead up to National Tree Day examining Australians' contact with nature. The reports include:

2011 - Climbing Trees: Getting Aussie Kids Back Outdoors highlighted the dramatic changes that have taken place over just one generation in the way that children play and interact with nature.

2012 - Planting Trees: Just What The Doctor Ordered reviewed the physical and mental health benefits of contact with nature for children, and the understanding of these benefits by Australian parents.

2013 - Missing Trees: The Inside Story Of An Outdoor Nation explored the attitudes and behaviour of Australians in regards to outdoor activities and contact with nature.

2014 - Valuing Trees: What is Nature Worth? investigated how much Australians value nature at work, home and school and the financial value that people assign to nature.

2015 - Needing Trees: The Nature of Happiness examined how contact with nature makes people happy across all life stages and the long-term implications that reduced contact with nature during childhood could have on the future happiness and wellbeing of today's children.

Planet Ark Environmental Foundation

Planet Ark 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 actions.

This year marks National Tree Day's 21st birthday. Over those years National Tree Day has enabled the planting of over 22 million trees, shrubs and grasses across Australia by over 3.5 million volunteers. National Tree Day aims to not only get Australians

outside and planting, but to also encourage people to add nature to their everyday lives.

Toyota

Toyota Australia has been the major sponsor of Planet Ark's National Tree Day since 2000. Toyota provides invaluable on-ground support for National Tree Day at local community and school tree planting sites around Australia by utilising its national dealer network and ambassadors. By supporting National Tree Day, Toyota is giving back to local Australian communities and demonstrating its commitment to support the environment and sustainability.

Acknowledgements

Planet Ark would like to gratefully acknowledge the funding support of Toyota, the research and report writing of Planet Ark staff member Amanda Cameron, the advice and editing assistance of Brad Gray, Debbie Agnew, Sara McGregor and Rebecca Gredley, also from Planet Ark. Attitudinal research was managed by Bernard Visperas from Pollinate and graphic design by Slade Smith.

PLANET ARK

 **TOYOTA**



Toyota has supported National Tree day since 2000.

Contents

Executive Summary	7
-------------------	---

Introduction To A Fulfilling Life	9
-----------------------------------	---

Nature Makes Us...	
Healthier	10
Happier	13
Brighter	16
Calmer	19
Closer	22

Take Ten To Reach Your Potential	24
----------------------------------	----



Lord Mayor Clover Moore, Tree Day Ambassador Costa Georgiadis and the City of Sydney and Planet Ark Teams.

Executive Summary

Feeling fulfilled with life is arguably the greatest ambition of every person. Appreciating the small things in daily life, rather than a few large achievements across one lifetime, is what creates long-term wellbeing and feelings of fulfilment.

Of particular importance to daily fulfilment is experiencing positivity in areas of life that a person feels passionate about. Drawing on past and present research, Planet Ark has identified five key areas of life that Australians feel passionate about to be health, happiness, learning, relaxation and relationships. When the needs of these areas are met on a daily basis, satisfaction and fulfilment with life is enhanced.

However, today's busy, time-poor and technological world means that people are increasingly turning to electronic devices and social media to try to improve everyday wellbeing, when in fact this behaviour can increase feelings of stress, depression and social isolation. Amazingly, one simple activity, engaging with nature, is able to significantly improve all five areas.

This report uses new results from a Planet Ark National Survey, new national and international peer-reviewed studies by doctors and scientists and previous reports by Planet Ark about contact with nature. The research presented identifies how nature has been shown medically and scientifically to enhance each of the five key areas that Australians consider the most important for a fulfilling life, enabling people to grow healthier, happier, brighter, calmer and closer.

HEALTHIER

- Time in nature reduces a person's chance of developing a range of diseases, including diabetes, cardiovascular disease, stroke, asthma, migraines and depression.
- People living in green areas are 40% less likely to be overweight or obese.
- 'Green' offices reduce sick leave taken by employees by 39%.

HAPPIER

- 86% of Australians with a strong connection to nature consider themselves to be overall happy in life.

- People with a high connection to nature are more likely to have a positive body image (57%), compared to people with a low connection to nature (42%).
- Nature induces feelings of positivity, enjoyment, playfulness and happiness through a number of physiological mechanisms, such as reducing blood pressure, activating the brain's dopamine reward system and lowering stress hormones.

BRIGHTER

- Students who take part in outdoor learning programs perform better in reading, writing, maths and science, with 77% of teachers reporting student improvement in standardised tests.
- Employees in offices with indoor plants produce more ideas and original solutions to problems, increasing productivity by 17%.
- Nature enhances creativity, concentration, enthusiasm for learning, critical thinking and memory, regardless of a person's age.

CALMER

- Outdoor activities reduce anxiety, tiredness and stress, and triple a person's chance of having a restful night's sleep.
- Just 10 minutes' relaxing outside is enough to significantly reduce blood pressure.
- Time in nature reduces the symptoms of ADHD and improves the behaviour and attitudes of adolescents.

CLOSER

- A high connection to nature makes people more likely to feel passionate about relationships with their friends and family.
- Public green spaces reduce loneliness and increase social interactions and a sense of community.
- Camping in nature at least doubles the frequency of sex for 89% of couples.

Extended periods of nature are not required to achieve these benefits. Spending just 10 minutes outside each day can enhance feelings of fulfilment and wellbeing.



HAPPIER

Nature activates the brain's dopamine reward system

BRIGHTER

Nature improves reading, maths and science

CALMER

10 minutes outside reduces blood pressure

CLOSER

Nature promotes positive feelings for family and friends

HEALTHIER

Nature reduces chance of diabetes by 43%

grow
MORE

JUST ADD NATURE

INTRODUCTION

To A Fulfilling Life

Feeling fulfilled is the subjective appreciation of one's life as a whole, and arguably the greatest ambition in life. Many people believe that fulfilment is achieved through long-term large accomplishments, but it is actually an accumulation of the everyday experiences of contentment and wellbeing that a person lives through^{3,4}. When people experience positive emotions and interactions in important areas of their everyday lives, they are significantly more likely to feel that their life has value, meaning and fulfilment⁵.

Based on five years of research and social surveys across Australia, Planet Ark identified five key areas Australians feel passionate about to be health, happiness, learning, relaxation and relationships. When the everyday needs of these five areas are met, Australians are significantly more likely to feel that they have positive and fulfilling lives.

The 'online society' that we now live in means that many Australians are turning to technology and social media when there is an unmet need in one of these key areas of everyday life. This behaviour can have significant mental and physical health repercussions, as the more time a person spends on social media



A prescription for nature is an easy, cheap and enjoyable way to experience a fulfilling life.

the more likely they are to believe that others are happier and life is unfair⁶. It is thought that this effect occurs as people publicly portray themselves online as being happier than they actually are⁷. Social comparisons make people believe they are inferior to others, leading to increased depressive symptoms, low self-esteem and negative self-evaluations⁸.

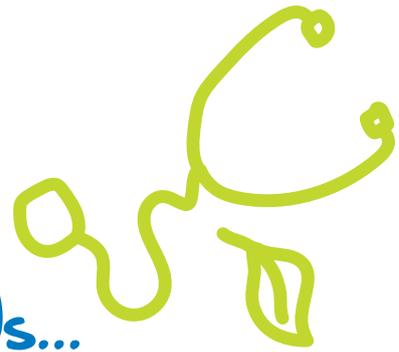
The 'fear of missing out', makes it difficult for many, particularly teens, to switch off from social media.

Further social media engagement is driven by the need to keep up with what's happening on social media and the 'fear of missing out' phenomenon, making it difficult for many, particularly teens, to switch off⁹. These social media effects mean that people can feel pressured to constantly be experiencing great happiness and feelings of fulfilment, when fulfilment should not be viewed as something to be achieved, but an ongoing process.

As half of Australians say that they use social media sites as a form of stress management (51%)⁹, it is not surprising that more than a third of Australians (35%) today say they have significant levels of stress and anxiety in their lives¹⁰.

This report will examine how, rather than technology being the answer, getting a nature fix is a mechanism by which key areas of everyday life can be enhanced and enriched, increasing overall feelings of fulfilment. New social research commissioned by Planet Ark uses the Nature Relatedness Scale (NRS)¹ to measure the differences in fulfilment experienced by people with high, medium and low connections to nature. This research is drawn together with Australian and international studies by scientists and medical professionals and previous social research by Planet Ark to identify how a prescription for everyday nature is the easiest, cheapest and most enjoyable way to help Australians experience a fulfilling life.

Nature Makes Us...



HEALTHIER

Lowers risk of disease

Australian and international studies have shown how proximity to nature from the home and spending time in nature can actually reduce a person's chance of developing a range of diseases, such as diabetes, cardiovascular disease, depression, asthma and migraines, even when accounting for age and socio-economic background¹¹⁻¹⁵ (Figure 1).



Time in nature can reduce the chances of developing cardiovascular disease, depression, asthma and migraines.

ADDING
Trees A PRESCRIPTION FOR HEALTH, HAPPINESS AND FULFILMENT

HEALTHIER **Rx** 10

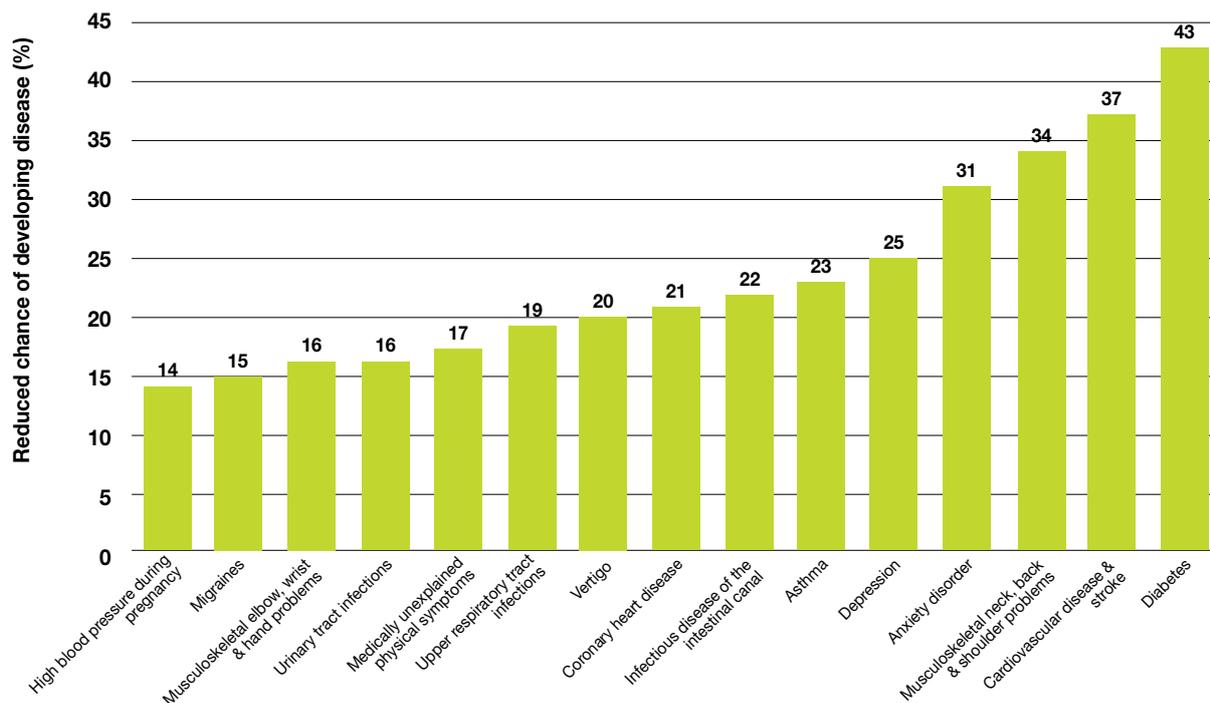


Figure 1. Reduced likelihood of developing diseases by spending time in nature, as identified in multiple Australian and international studies¹¹⁻¹⁵

Lowers BMI

People living in areas with high levels of greenery are 40% less likely to be overweight or obese¹⁶. This is partly related to an increase in physical activity, with over 50 studies showing that living near green space increases the amount of physical activity that a person engages in¹⁷. People who exercise outside rather than inside also report increased feelings of enjoyment and satisfaction greatly, increasing motivation and the probability that they will repeat the physical activity^{18,19}.

Reduced body weight resulting from increased time in nature is due to more than just increased physical activity. Adiponectin is a hormone important in controlling metabolic processes. Overweight and obese people exhibit lower levels of the hormone²⁰. Exercising in a forest environment significantly increases blood adiponectin levels compared to exercising in an urban environment²¹, demonstrating that the location of exercise has direct impacts on its metabolic effects.



People who exercise outside than report increased feelings of enjoyment and satisfaction.

People living in green neighbourhoods and who engaging in outdoor activities therefore have the benefit of healthier body size and reduced impacts of weight related problems, such as sleep apnea, hypertension, stroke, diabetes and cardiovascular disease^{17,22}.

Reduces sick days

Sick days cost the Australian economy \$32.5 billion a year in payroll and lost productivity costs²³. Simply

introducing plants to an office can reduce fatigue, headaches, sore throats and dry skin in employees²⁴, with offices refurbished to a Green Building Standard reducing sick leave days by a staggering 39%²⁵.

Furthermore, views of and time in nature improves prevention and recovery from minor illnesses such as colds and headaches, as well as greatly reducing recovery time from surgery, reduce the need for pain medication^{26,27} and improve cardiac function in heart disease patients²⁸.



Nature improves recovery from minor illnesses like colds and reduces recovery time from surgery.

Nature Makes Us...



HAPPIER

Creates a happier mind

The Planet Ark National Survey revealed that people who have a closer connection to nature are significantly more likely to consider themselves happy in life overall (Figure 2). This result corresponds to previous Planet Ark research that showed when people increase their monthly outdoor activity by just one third it will greatly increase how happy they rate themselves to be², with nature inducing feelings of enjoyment, positive engagement and playfulness^{18,29}. The increase in happiness is linked to changes in the brain and hormone secretion, with nature quite literally creating a happier mind. These changes include activation of the dopamine reward system³⁰, structures in the limbic system that respond to happiness-induced recall³¹, and decreasing cortisol secretion and irregularity the more green space a person is exposed to³².

People who have a closer connection to nature are significantly more likely to consider themselves happy.

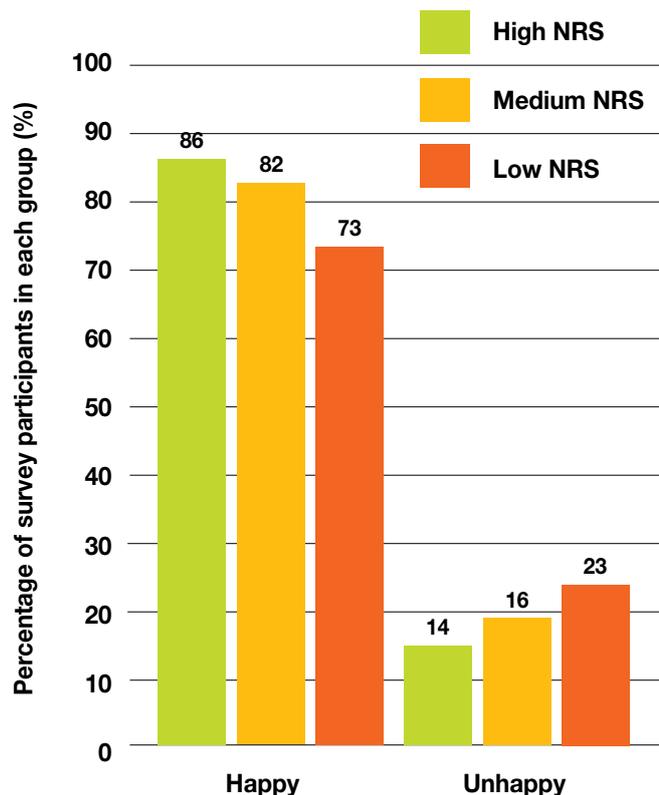


Figure 2. The percentage of survey participants with high, medium and low Nature Relatedness that consider themselves to be overall happy or unhappy in life.



Time in nature has a positive effect on the brain including activating the dopamine reward system.



People with a high connection to nature are significantly more likely to have a positive body image.

Improves body image

Regardless of a person's BMI, the Planet Ark National Survey revealed that people with a high connection to nature are significantly more likely to have a positive attitude towards their body image (57%), than people with a low connection to nature (42%) (Figure 3).

Body dissatisfaction has been identified as one of the most consistent and robust risk factors for eating disorders, as well as being a significant predictor of low self-esteem, depression and obesity³³. If spending more time outside in nature during the critical development period for children and adolescents helps to improve perceptions of body image, increasing outdoor activities during this time could lead to significant long-term physical and mental health benefits.

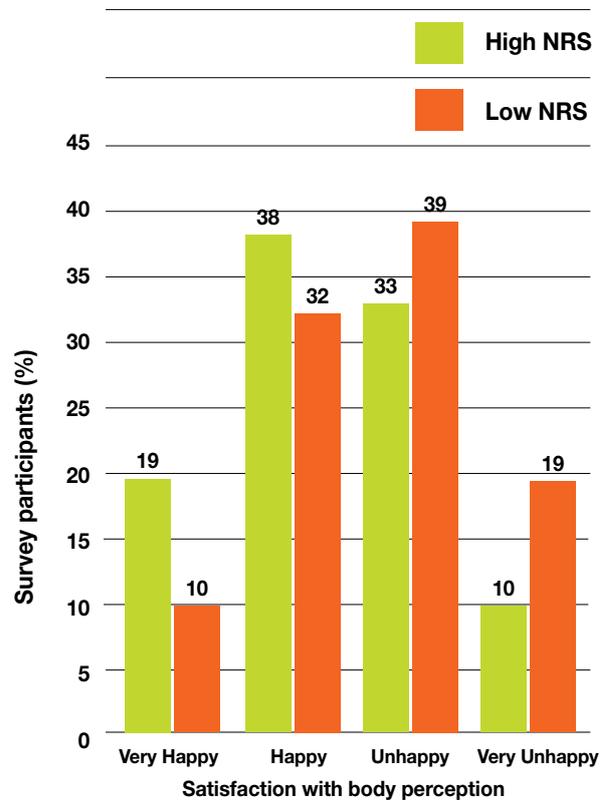


Figure 3. Satisfaction with body perception for survey participants with high and low Nature Relatedness



Happier adults engaged in more outdoor activities whilst growing up.

Grows happier children into happier adults

Time in nature has positive effects on the behaviour and emotional development of children. A huge variety of studies have identified outcomes such as: improved classroom behaviour when breaks involve outdoor play³⁴; increase in positive emotions following nature-based activities^{35,36}; and a higher sense of self-worth, self-esteem and greater resilience during

stressful situations for children with more nature nearby to their home³⁷.

These nature experiences during childhood have long lasting benefits, with happier adults found to have engaged in one-third more outdoor activities (31%) whilst growing up than people who rate themselves as 'low' on a subjective happiness scale².

Nature Makes Us...

BRIGHTER

The increased ability to learn, either academically or socially, can contribute significantly to fulfilment through academic and career accomplishments, secure employment, financial stability, social networks and a sense of achievement. Parents often wish academic success for their children. With Australian parents spending an average of \$4,737 per secondary school child every year if they attend a government school, and \$24,351 if they attend a private school³⁸, free activities that can enhance a child's academic performance have a large financial incentive. An increased engagement with learning and new experiences is also of great importance when it comes to problem solving, critical thinking, creativity and confidence in approaching new situations.

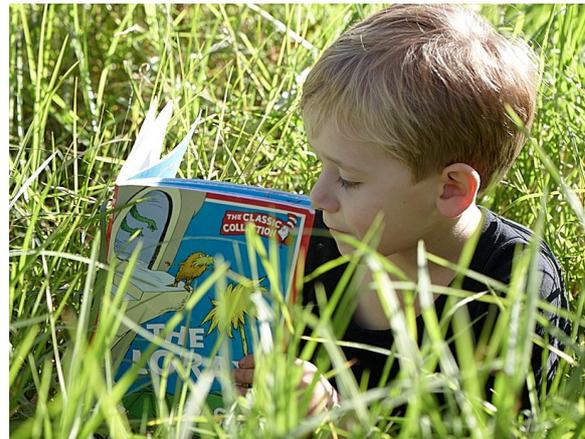


Outside learning improves student behaviour and achievement.

Enhances academic performance

Getting students outside in environment-based learning programs increases a range of student behaviours and achievements, including academic performance in reading, writing, maths, science and standardised tests³⁹ (Figure 4). Simply seeing nature from the classroom can even make a significant difference. Larger windows with a view of nature leads to higher standardised test scores, graduation rates and the proportion of students that plan on attending higher education^{40,41}.

The enhanced academic performance of students is linked to nature increasing cognitive function, memory and the ability to direct attention. The cognitive functioning of children and their ability to focus attention, for example, improves when greenery within the home environment increases⁴³, whilst a walk in a park enhances performance in memory-based tasks⁴⁴.



Nature increases cognitive function, memory and the ability to direct attention.

Larger windows with a view of nature leads to higher standardised test scores.

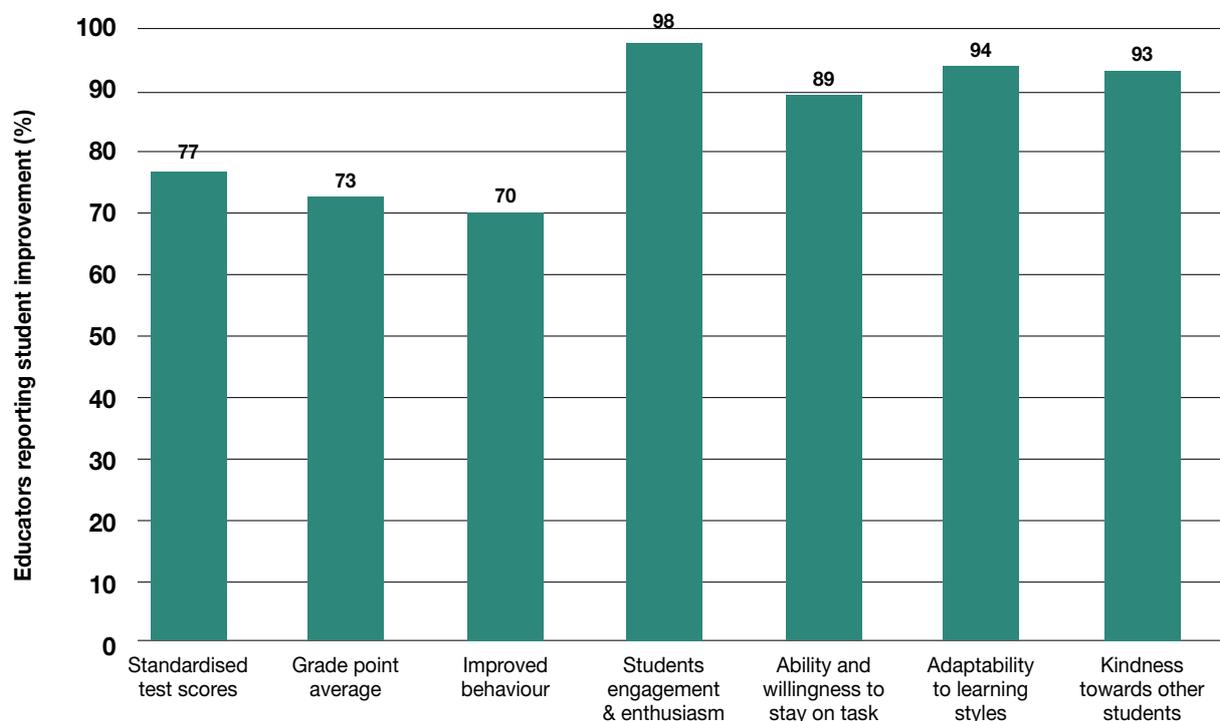


Figure 4. Student behaviours and academic achievements that educators report are improved by environment-based learning programs. Adapted from Lieberman and Hoody (1998) 39,42.

Spawns creativity and improves problem solving

Outdoor play areas and naturalised grounds in childcare centres and schools increase imaginative play^{45,46}, enthusiasm for school and engagement in creative projects⁴⁷. The children are also better at working together in groups and thinking critically to solve problems³⁹.

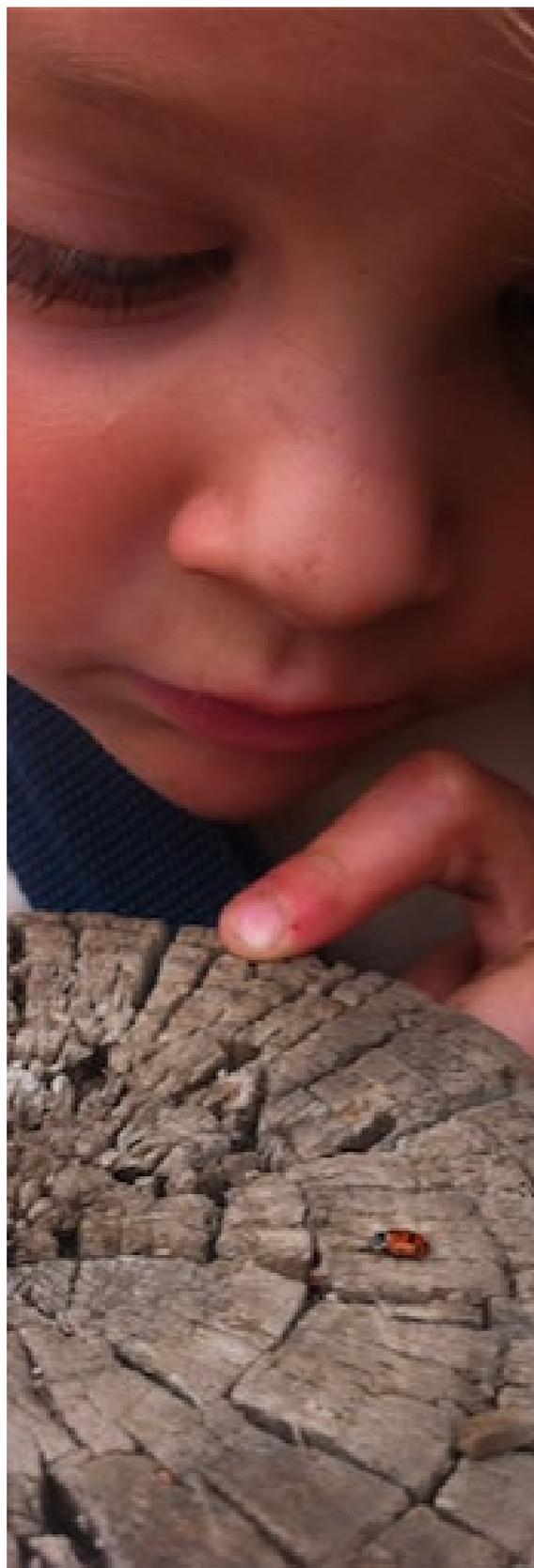
These benefits are expressed in adults as well as children. When indoor plants are present office workers generate more ideas and original solutions to problems, with women in particular generating more creative and flexible solutions⁴⁸. Adding just a single plant to a desk is enough to have a positive effect on performance with a creative task⁴⁹.

Increases productivity

Decorating offices with plants increases productivity by 17%^{50,51}, with employees better able to concentrate⁵² and recover faster from mental fatigue⁵³. In addition to the psychological effects that indoor plants can have on mood⁵⁴, the cause of increased productivity has been linked to changes in air quality. Indoor plants decrease carbon dioxide levels by approximately 10% in air-conditioned buildings and 25% in naturally ventilated buildings.

Studies have consistently shown that as ventilation rates increase (decreasing carbon dioxide), performance and productivity in both offices⁵⁵ and schools⁵⁶ rise⁵⁷.

Decorating offices with plants increases productivity by 17%, with employees better able to concentrate and recover faster from mental fatigue.



Outdoor play areas in childcare centres increases imaginative play.

Nature Makes Us...



CALMER

Lowers stress

Nature has overwhelmingly been shown to reduce stress. Employees who have contact with nature during their workday, such as taking lunch breaks outside, report significantly reduced stress and stress-related health complaints⁵⁸. Moving home from an urban to a greener area is associated with improved and sustained mental health⁵⁹, and engaging in outdoor leisure activities reduces rumination⁶⁰, anxiety and tiredness, with greater benefits observed in people with higher levels of stress⁶¹.



A high connection to nature also triples a person's chance of having a very restful night's sleep.



People who engage in daily outdoor activities report higher levels of wellbeing.

Just 10 minutes spent relaxing in a natural environment has been shown to cause a significant reduction in blood pressure and improve mental health and wellbeing⁶³

Just 10 minutes spent relaxing outside in a natural environment has been shown to cause a significant reduction in blood pressure⁶² and improve mental health and wellbeing⁶³.

How nature lowers stress:

NATURE INCREASES	NATURE DECREASES
1. Activity in the limbic system responsible for happiness-induced recall ³¹	1. Blood pressure and heart rate ⁶⁵
2. Quality of sleep ²	2. Cortisol secretion and irregularity, which correlate to stress ³²
3. Alpha wave activity in the brain, influencing relaxation and effortless alertness ⁶⁴	3. Neural activity in the subgenual prefrontal cortex, active during rumination ⁶⁰
4. Parasympathetic activity within the nervous system, which occurs when feeling relaxed ⁶⁵	4. Sympathetic activity within the nervous system which occurs when feeling stressed ⁶⁵

Increases relaxation and calmness

Viewing nature elicits positive emotions, such as relaxation, calmness, self-worth and enjoyment^{66,67}. When employees have a view of nature from their desk, their level of job satisfaction⁶⁸ and attitude towards their work⁶⁹ improves, whilst people who engage in daily outdoor activities report higher levels of wellbeing⁷⁰.

Lowering blood pressure and pulse rate are two of the ways in which nature helps create calmness⁶⁵. A high connection to nature also triples a person's chance of having a very restful night's sleep, bringing with it the cascade of benefits that healthy sleep induces in a person's level of stress hormones, immune system, growth, appetite control, relaxed breathing and cardiovascular health⁷¹.

Reduces problem behaviour in children

ADHD is a mental disorder that causes a persistent pattern of inattention and/or hyperactivity-impulsivity, impacting a child's school work, family and social relationships and feelings of self-worth⁷². ADHD is now the most commonly diagnosed behavioural disorder in children, affecting over 7% of young Australians⁷³. Amazingly, time in nature can reduce the symptoms of ADHD, with activities in natural environments found to reduce the overall severity of symptoms⁷³ and increase concentration and attention⁷⁴. The effect of time in nature is even comparable to the effect of commonly prescribed medication, methylphenidate⁷⁴.

Nature has the ability to improve general behaviours across all groups of children and young people. Adolescents who spend the day learning in a forest report reduced stress and anger, with the effects greatest in students who have records of poor behaviour⁷⁵. Conducting science projects outdoors in naturalised habitats has also been shown to significantly reduce rude and aggressive behaviour in children⁷⁶, whilst high school students with views of nature from their classroom have lower occurrences of criminal behaviour⁴¹. Simply adding plants at the back of a classroom can significantly increase students' friendliness, reduce absences for illness and decrease records of misbehaviour⁷⁷.



Adding plants to a classroom can significantly increase students' friendliness and reduce absences.

Nature Makes Us...



CLOSER

More passionate relationships

The Planet Ark National Survey revealed that Australians with a high connection to nature are more likely to feel passionate about their relationships with family and friends compared to people with a low connection to nature (Figure 5). This result corresponds to previous Planet Ark research that showed people with a low connection to nature have smaller social networks².



Nature appears to facilitate cooperative and positive social behaviour.

The presence of public green spaces increases social interactions between residents and positively relates to sense of community.

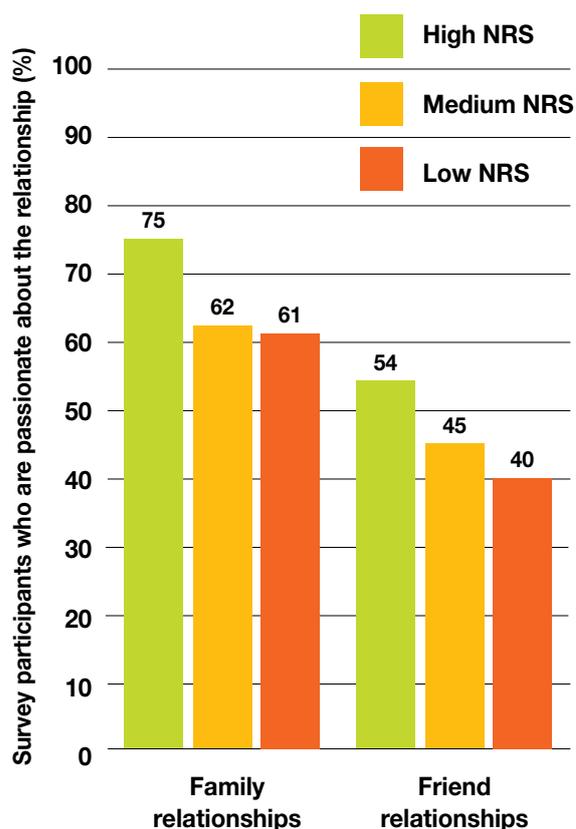


Figure 5. The percentage of survey participants with high, medium and low connections to nature that are passionate about their relationships with their family and friends.

Closer communities

Nature appears to facilitate cooperative and positive social behaviour. The presence of public green spaces increases social interactions between residents and positively relates to sense of community⁷⁸. When residents of public housing have access to a common green area, for example, there is an increase in social activities, visitors, familiarity among neighbours and a willingness to support each other⁷⁹.

This increase in community and social cohesion from green spaces has been linked to reductions in crime, a reduced likelihood of a person smoking⁸⁰ and people feeling less lonely and socially isolated⁸¹.

Better love lives

A study that examined the love lives of couples during and after a camping trip found that time away in nature at least doubled the frequency of sex for 89% of couples, an effect that continued even after returning home (Figure 6)⁸².

The Planet Ark National Survey found that one in four adult Australians in relationships stated tiredness (29%) and stress (22%) as the top two reasons preventing them from having a more satisfying love life. As these are two variables nature has been shown to significantly reduce, it is easy to see why time in nature helps to improve the love lives of couples and brings people closer together.

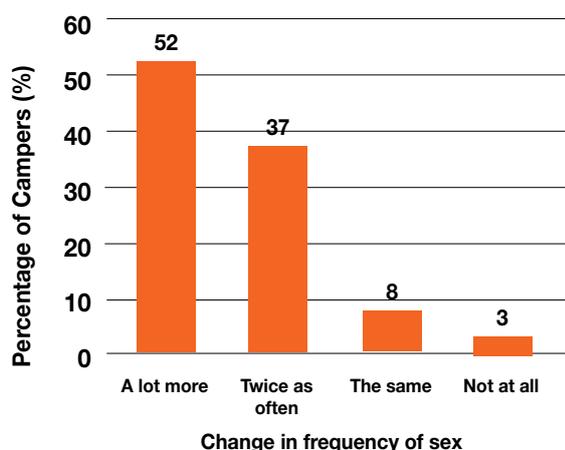


Figure 6. Graph to show how the frequency with which adult couples had sex changed during and after a camping trip, compared to before the trip.



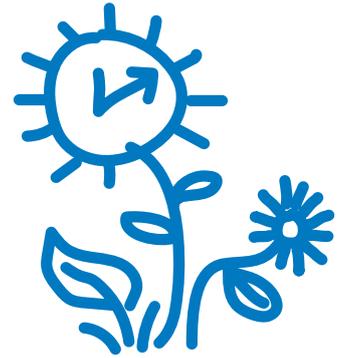
Green space has been linked to reductions in both crime and feelings of loneliness.



A camping trip was found to double the frequency of sex for 89% of couples.

TAKE TEN

to Reach Your Potential



Adding a little bit of nature to your everyday activities can enhance your health, happiness, ability to learn, calmness and relationships, five of the key areas Australians feel most passionate about. This means that the simple act of going outside, into the garden, the local park or one of Australia's beautiful beaches is a free, enjoyable and easy way to help you reach your potential and live a more fulfilling life.

The great news is that you do not need to spend hours outside to experience these benefits. Just ten minutes in nature lowers blood pressure⁶² and stress, whilst increasing overall wellbeing, mental health, behaviour, mood, productivity and concentration⁶³. As everyone can find just ten minutes each day to get outside, 'Take Ten' is an achievable goal.

The overwhelming number of benefits associated with nature and the simple ways in which it can be encountered means that it is no surprise both doctors and scientists agree: a prescription of just ten minutes nature time each day is enough to start reaping benefits.



Just ten minutes of nature time a day is enough to start reaping benefits

ADDING
Trees A PRESCRIPTION FOR HEALTH, HAPPINESS AND FULFILMENT

TAKE TEN

Rx 24

For Teachers

No matter what subject you teach, all areas of the curriculum can benefit from incorporating outdoor learning and nature based activities. Furthermore, it is not just the students that gain from the experience, with teachers reporting a renewed enthusiasm for teaching when they get outside.⁴²

Schools Tree Day is a great way of getting your students engaging in a fun, hands on activity with nature. Every year around 3,000 pre-schools, primary schools and high schools take part by:

- Planting trees
- Growing seedlings
- Building veggie gardens
- Taking part in nature-care activities
- Learning outdoors

Visit the Schools Tree site to find out about the many activities your school can take part in and access our lesson plans and learning resources.



Schools Tree Day is a great way to get of students engaged in hands on nature activity.



Teachers report a renewed enthusiasm for teaching when they get outside.

For Parents

Shrinking backyards means that it is more important than ever to make sure your family is getting its daily dose of nature. With busy lives and packed schedules one of the best ways to add nature is to take an activity your children are already doing inside and move it outside:

- Do homework outside; laptops were made to be portable.
- Walk to school instead of taking the car or bus. If the distance from home to school is too far, get out of the car or off the bus a couple of stops early.
- Nearly any activity that can be done on the living room floor can be taken outside. So take your board games, puzzles, toys, and arts and crafts outdoors.
- Make sure you, the parents, are spending time outside in nature too. Research has shown that the more time parents spend outdoors, the more time their children spend outdoors.⁸³



Shrinking backyards means it is important to make sure your family is getting its daily dose of nature.



Swap the traditional dinner and movie date-night with something more natural.

For Couples

Planning time alone together as a couple can be difficult, especially if you have children. Swap the traditional dinner and movie date-night with something more natural. Plan an activity you can do together outside in nature, such as:

- Bushwalking
- Camping
- Picnicking at a park, beach or yard
- Swimming

For Everybody - Take Ten

Finding ways to ensure you are getting at least 10 minutes of 'green time' everyday should be a target for everyone. The simplest way to achieve this goal is to incorporate nature into the activities you are already carrying out:

- Ditch your desk and spend your lunch break outside.
- Walk or ride your bike, all or part of the way, to work.
- Add plants to your office desk.
- Eat outside as often as you can.
- If you work from home set up a space to work outside, take your laptop the park or set your desk up so you are looking out the window.

National Tree Day: The Ultimate Nature Fix

Take part in National Tree Day and experience the ultimate nature fix. Each year over 250,000 Australians help to promote a healthy planet by planting trees, conducting bush regeneration and getting green in our 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 3.5 million Australians who have been reaching their potential with nature for the past 21 years.



Tree Day has benefits for the planet and people.



Each year over 250,000 Australians get involved in National Tree Day.

REFERENCES

- Nisbet, E. K. & Zelenski, J. M. The NR-6: a new brief measure of nature relatedness. *Frontiers in Psychology* **4**, 1–11 (2013).
- Cameron, A. *Needing Trees: The Nature of Happiness*. (Planet Ark, 2015).
- King, L. A., Hicks, J. A., Krull, J. L. & Del Gaiso, A. K. Positive affect and the experience of meaning in life. *Journal of personality and social psychology* **90**, 179 (2006).
- Lavallee, L. F., Hatch, P. M., Michalos, A. C. & McKinley, T. Development of the contentment with life assessment scale (CLAS): Using daily life experiences to verify levels of self-reported life satisfaction. *Social Indicators Research* **83**, 201–244 (2007).
- Fagley, N. S. Appreciation uniquely predicts life satisfaction above demographics, the Big 5 personality factors, and gratitude. *Personality and Individual Differences* **53**, 59–63 (2012).
- Chou, H.-T. G. & Edge, N. 'They are happier and having better lives than I am': the impact of using Facebook on perceptions of others' lives. *Cyberpsychology, Behavior, and Social Networking* **15**, 117–121 (2012).
- Jordan, A. H. *et al.* Misery has more company than people think: Underestimating the prevalence of others' negative emotions. *Personality and Social Psychology Bulletin* **37**, 120–135 (2011).
- Steers, M.-L. N., Wickham, R. E. & Acitelli, L. K. Seeing everyone else's highlight reels: How Facebook usage is linked to depressive symptoms. *Journal of Social and Clinical Psychology* **33**, 701 (2014).
- Fear of Missing Out survey*. (Australian Psychological Society, 2015).
- APS Stress and wellbeing in Australia survey 2015*. (Australian Psychological Society, 2015).
- Maas, J. *et al.* Morbidity is related to a green living environment. *Journal of epidemiology and community health* **63**, 967–973 (2009).
- Pereira, G. *et al.* The association between neighborhood greenness and cardiovascular disease: an observational study. *BMC Public Health* **12**, 1 (2012).
- Tamosiunas, A. *et al.* Accessibility and use of urban green spaces, and cardiovascular health: findings from a Kaunas cohort study. *Environmental Health* **13**, 20 (2014).
- Grazuleviciene, R. *et al.* The influence of proximity to city parks on blood pressure in early pregnancy. *International Journal of Environmental Research and Public Health* **11**, 2958–2972 (2014).
- Bodicoat, D. H. *et al.* The association between neighbourhood greenspace and type 2 diabetes in a large cross-sectional study. *BMJ open* **4**, e006076 (2014).
- Ellaway, A., Macintyre, S. & Bonnefoy, X. Graffiti, greenery, and obesity in adults: secondary analysis of European cross sectional survey. *Bmj* **331**, 611–612 (2005).
- Lachowycz, K. & Jones, A. P. Greenspace and obesity: a systematic review of the evidence. *Obesity reviews* **12**, e183–e189 (2011).
- Thompson Coon, J. *et al.* Does participating in physical activity in outdoor natural environments have a greater effect on physical and mental wellbeing than physical activity indoors? A systematic review. *Environmental Science and Technology* **45**, 1761–1772 (2011).
- Gladwell, V. F., Brown, D. K., Wood, C., Sandercock, G. R. & Barton, J. L. The great outdoors: how a green exercise environment can benefit all. *Extreme physiology & medicine* **2**, 1 (2013).
- Kern, P. A., Di Gregorio, G. B., Lu, T., Rassouli, N. & Ranganathan, G. Adiponectin expression from human adipose tissue relation to obesity, insulin resistance, and tumor necrosis factor- expression. *Diabetes* **52**, 1779–1785 (2003).
- Li, Q. *et al.* Acute effects of walking in forest environments on cardiovascular and metabolic parameters. *European Journal of Applied Physiology* **111**, 2845–2853 (2011).
- Bell, J. F., Wilson, J. S. & Liu, G. C. Neighborhood greenness and 2-year changes in body mass index of children and youth. *American journal of preventive medicine* **35**, 547–553 (2008).
- Absenteeism Survey. (2015). at <<http://www.dhs.net.au/insight/2015-absenteeism-survey/>>
- Fjeld, T., Veiersted, B., Sandvik, L., Riise, G. & Levy, F. The effect of indoor foliage plants on health and discomfort symptoms among office workers. *Indoor and Built Environment* **7**, 204–209 (1998).
- Green Star Performance*. (Green Building Council of Australia, 2012).
- Ulrich, R. View through a window may influence recovery. *Science* **224**, 224–225 (1984).
- Park, S.-H. & Mattson, R. H. Therapeutic influences of plants in hospital rooms on surgical recovery. *HortScience* **44**, 102–105 (2009).
- Grazuleviciene, R. *et al.* The effect of park and urban environments on coronary artery disease patients: a randomized trial. *BioMed research international* **2015**, (2015).
- Keniger, L. E., Gaston, K. J., Irvine, K. N. & Fuller, R. A. What are the Benefits of Interacting with Nature? *International Journal of Environmental Research and Public Health* **10**, 913–935 (2013).
- Selhub, E. M. & Logan, A. C. *Your Brain On Nature: The Science of Nature's influence on Your Health, Happiness and Vitality*. (Wiley, 2012).
- Kim, G.-W. *et al.* Functional Neuroanatomy Associated with Natural and Urban Scenic Views in the Human Brain: 3.0T Functional MR Imaging. *Korean Journal of Radiology* **11**, 507–513 (2010).
- Thompson, C. W. *et al.* More green space is linked to less stress in deprived communities: Evidence from salivary cortisol patterns. *Landscape and Urban Planning* **105**, 221–229 (2012).
- Grabe, S., Ward, L. M. & Hyde, J. S. The role of the media in body image concerns among women: a meta-analysis of experimental and correlational studies. *Psychological bulletin* **134**, 460 (2008).
- Barros, R. M., Silver, E. J. & Stein, R. E. School recess and group classroom behavior. *Pediatrics* **123**, 431–436 (2009).
- Block, K. *et al.* Growing Community The Impact of the Stephanie Alexander Kitchen Garden Program on the Social and Learning Environment in Primary Schools. *Health Education & Behavior* **39**, 419–432 (2012).
- Swank, J. M. & Shin, S. M. Garden counseling groups and self-esteem: A mixed methods study with children with emotional and behavioral problems. *The Journal for Specialists in Group Work* **40**, 315–331 (2015).
- Wells, N. M. & Evans, G. W. Nearby nature a buffer of life stress among rural children. *Environment and behavior* **35**, 311–330 (2003).
- ASG's *Education Costs Estimates*. (ASG, 2016).
- Lieberman, G. A. & Hoody, L. L. Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning. Results of a Nationwide Study. (1998).
- Benfield, J. A., Rainbolt, G. N., Bell, P. A. & Donovan, G. H. Classrooms With Nature Views Evidence of Differing Student Perceptions and Behaviors. *Environment and behavior* **47**, 140–157 (2015).
- Matsuoka, R. H. Student performance and high school landscapes: Examining the links. *Landscape and Urban Planning* **97**, 273–282 (2010).
- Dyment, J. E. Nature Nurtures: Investigating the Potential of School Grounds and Greening School Grounds: Creating Habitats for Learning. *Canadian Journal of Environmental Education* **6**, 251–254 (2001).
- Wells, N. M. At home with nature effects of 'greenness' on children's cognitive functioning. *Environment and behavior* **32**, 775–795 (2000).



44. Herzog, T. R., Black, A. M., Fountaine, K. A. & Knotts, D. J. Reflection and attentional recovery as distinctive benefits of restorative environments. *Journal of Environmental Psychology* **17**, 165–170 (1997).
45. Dowdell, K., Gray, T. & Malone, K. Nature and its influence on children's outdoor play. *Australian Journal of Outdoor Education* **15**, 24–35 (2011).
46. Francis, M., Paige, K. & Lloyd, D. Middle years students' experiences in nature: A case study on nature-play. (2013).
47. *Schoolyard Learning: The Impact of School Grounds*. (Education Development Centre, Boston, USA, 2000).
48. Ulrich, R. The Impact of Flowers and Plants on Workplace Productivity. (2003).
49. Shibata, S. & Suzuki, N. Effects of the foliage plant on task performance and mood. *Journal of Environmental Psychology* **22**, 265–272 (2002).
50. Knight, C. & Haslam, S. A. The relative merits of lean, enriched, and empowered offices: an experimental examination of the impact of workspace management strategies on well-being and productivity. *Journal of Experimental Psychology: Applied* **16**, 158 (2010).
51. Bringslimark, T., Hartig, T. & Patil, G. G. Psychological benefits of indoor plants in workplaces: Putting experimental results into context. *HortScience* **42**, 581–587 (2007).
52. Bergs, J. Effect of healthy workplaces on well-being and productivity of office workers. in (2002).
53. Shibata, S. & Suzuki, N. Effects of Indoor Foliage Plants on Subjects' Recovery from Mental Fatigue. *North American Journal of Psychology* **3**, (2001).
54. Larsen, L., Adams, J., Deal, B., Kweon, B.-S. & Tyler, E. Plants in the workplace the effects of plant density on productivity, attitudes, and perceptions. *Environment and behavior* **30**, 261–281 (1998).
55. Seppänen, O., Fisk, W. J. & Lei, Q. H. Ventilation and performance in office work. *Indoor air* **16**, 28–36 (2006).
56. Wargocki, P., Wyon, D., Matysiak, B. & Irgens, S. The effects of classroom air temperature and outdoor air supply rate on performance of school work by children. in (2005).
57. Nieuwenhuis, M., Knight, C., Postmes, T. & Haslam, S. A. The relative benefits of green versus lean office space: Three field experiments. *Journal of Experimental Psychology: Applied* **20**, 199 (2014).
58. Largo-Wight, E., Chen, W. W., Dodd, V. & Weiler, R. Healthy workplaces: The effects of nature contact at work on employee stress and health. *Public Health Reports* **126**, 124 (2011).
59. Alcock, I., White, M. P., Wheeler, B. W., Fleming, L. E. & Depledge, M. H. Longitudinal effects on mental health of moving to greener and less green urban areas. *Environmental Science and Technology* **48**, 1247–1255 (2014).
60. Bratman, G. N., Hamilton, J. P., Hahn, K. S., Daily, G. C. & Gross, J. J. Nature experience reduces rumination and subgenual prefrontal cortex activation. *Proceedings of the National Academy of Sciences* **112**, 8567–8572 (2015).
61. Hull, R. B., IV & Michael, S. E. Nature based Recreation, mood change, and stress restoration. *Leisure Sciences* **17**, 1–14 (1995).
62. Hartig, T., Evans, G. W., Jamner, L. D., Davis, D. S. & Gärling, T. Tracking restoration in natural and urban field settings. *Journal of Environmental Psychology* **23**, 109–123 (2003).
63. Bernsten, L. A. Take ten (minutes) outside: Bridging the gap between the office and nature. (University of Akamai, Hilo, HI, 2012).
64. Martindale, C. & Mines, D. Creativity and cortical activation during creative, intellectual and EEG feedback tasks. *Biological Psychology* **3**, 91–100 (1975).
65. Park, B.-J., Tsunetsugu, Y., Kasetani, T., Kagawa, T. & Miyazaki, Y. The physiological effects of Shinrin-yoku (taking in the forest atmosphere or forest bathing): evidence from field experiments in 24 forests across Japan. *Environmental health and preventive medicine* **15**, 18–26 (2010).
66. Berman, M. G., Jonides, J. & Kaplan, S. The Cognitive Benefits of Interacting With Nature. *Psychological Science* **19**, 1207–1212 (2008).
67. Kaplan, R. The nature of the view from home. *Environment and Behaviour* **33**, 507–542 (2001).
68. Lottrup, L., Stigsdotter, U. K., Meilby, H. & Claudi, A. G. The Workplace Window View: A Determinant of Office Workers' Work Ability and Job Satisfaction. *Landscape Research* 1–19 (2013).
69. Lottrup, L., Grahn, P. & Stigsdotter, U. K. Workplace greenery and perceived level of stress: Benefits of access to a green outdoor environment at the workplace. *Landscape and Urban Planning* **110**, 5–11 (2013).
70. Passmore, H.-A. & Howell, A. J. Nature involvement increases hedonic and eudaimonic well-being: A two-week experimental study. *Ecopsychology* **6**, 148–154 (2014).
71. The Benefits of Slumber. *US National Institutes of Health* (2013). at <<https://newsinhealth.nih.gov/issue/apr2013/feature1>>
72. Lawrence, D. *et al.* The Mental Health of Children and Adolescents: Report on the Second Australian Child and Adolescent Survey of Mental Health and Wellbeing. (2015).
73. Faber Taylor, A. & Kuo, F. E. M. Could exposure to everyday green spaces help treat ADHD? Evidence from children's play settings. *Applied Psychology: Health and Well Being* **3**, 281–303 (2011).
74. Taylor, A. F. & Kuo, F. E. Children with attention deficits concentrate better after walk in the park. *Journal of Attention Disorders* **12**, 402–409 (2009).
75. Roe, J. & Aspinall, P. The restorative outcomes of forest school and conventional school in young people with good and poor behaviour. *Urban Forestry & Urban Greening* **10**, 205–212 (2011).
76. Chawla, L., Keena, K., Pevec, I. & Stanley, E. Green schoolyards as havens from stress and resources for resilience in childhood and adolescence. *Health & place* **28**, 1–13 (2014).
77. Han, K.-T. Influence of limitedly visible leafy indoor plants on the psychology, behavior, and health of students at a junior high school in Taiwan. *Environment and behavior* (2008).
78. Jennings, V., Larson, L. & Yun, J. Advancing sustainability through urban green space: cultural ecosystem services, equity, and social determinants of health. *International Journal of Environmental Research and Public Health* **13**, 196 (2016).
79. Kuo, F. E., Bacaicoa, M. & Sullivan, W. C. Transforming inner-city landscapes trees, sense of safety, and preference. *Environment and behavior* **30**, 28–59 (1998).
80. Andrews, J. O. *et al.* The association of individual and neighborhood social cohesion, stressors, and crime on smoking status among African-American women in southeastern US subsidized housing neighborhoods. *Journal of Urban Health* **91**, 1158–1174 (2014).
81. Maas, J. *Vitamin G: Green environments- Healthy environments*. (NIVEL, Netherlands Institute for Health Services Research, 2008).
82. *Camping improves your sex life*. (OLPRO, 2013).
83. *Missing Trees: The Inside Story of an Outdoor Nation*. (Planet Ark, 2013).