



greenminds

greenminds insight paper

**How Children Engage with
Nature: A Model for Monitoring
the Nature Connectedness
of School Children on
a Citywide Scale**



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Green Minds Model summary

The Green Minds Model aims to summarise the structure of the GM approach, to aid its transfer and replication to other urban areas and authorities.

Green Minds piloted new ways of implementing nature-based solutions within an urban environment. The project's central aim was to collaborate with stakeholders to recognise how humans, as part of nature, interact with nature in a complex system and to identify ways in which *systemic* change is brought about.

The model is presented as an integrated approach, where various nested elements are shown working together as a system. It reflects the particular challenges and scales of focus in urban areas - from individuals, to communities and neighbourhoods and at a citywide level. It focuses on particular leverage points for change (best practices) with regard to nature in cities, and is guided at its core by a set of underlying principles to inform practice.

At the centre of the model sits the system goal - *Urban Wilding. A set of guiding Principles have been created to inform the practice of Urban Wilding. These principles have emerged from our experiences designing and implementing Urban Wilding in Plymouth.

The eight Principles that have emerged from our programme of testing and development represent key leverage points to effect system change and to successfully integrate nature within urban place shaping. This includes exploring deeply held beliefs and values around our relationship to nature and to others, the creation of new organisational and digital infrastructures which empower citizens, and the development of new policy, planning and financial frameworks to support this.

Complex systems can behave differently at differing scales and so these are reflected too in the model to recognise the importance of understanding *who* needs to be engaged and *how*. This takes into account the need for multiple perspectives and the importance of equity (who participates), through an

inclusive process of engagement from individuals to groups and organisations, and at neighbourhood and citywide scales.

Finally, the model acknowledges the importance of an ongoing and iterative co-design process. This process recognises that resilience requires the ability to adapt as solutions emerge within a complex and constantly changing environment. It is delivered through a cyclical, action learning approach in which lessons learned influence the next cycle of implementation to ensure a progressive approach.

The model is brought to life through our suite of Insight Papers, Guides and Case Studies which aim to illustrate how the model was implemented and what we learnt.

Green Minds Urban Wilding Principles

The quality and quantity of nature has declined significantly in recent decades. Across the UK and Europe, nature recovery and restoration, rather than just preserving or conserving what remains, has become a high priority, as we have become more aware of society's dependence on nature[1].

We know that spaces that are more biodiverse can deliver multiple health and wellbeing benefits as well as other nature-based solutions such as improvements in water drainage, increased carbon sequestration, removal of air pollutants and increased pollination for food security[2]. 'Rewilding' has gained prominence as one approach to achieving such improvements in biodiversity, with a growing research body assessing its impact.

Urban (re)wilding, however, is still a new concept. We define Urban Wilding as 'any initiative, both human-aided and natural colonization, that aims to encourage biodiversity, ecosystem function and native species in urban settings'[3].

Urban Wilding is fundamentally different from wilding/rewilding/renaturing elsewhere. Cities and towns are dominated by human infrastructure and activity. Consequently, many natural ecosystem processes are significantly modified or constrained in urban areas. We rely upon ecosystem services for our health and wellbeing. Urban ecologies, which deliver these ecosystem services, are complex and poorly understood. However, we know that more biodiverse systems deliver more or better ecosystem services. We also know that we can mimic, or engineer, some specific ecosystem services such as storm water management. Whilst we don't know enough to design urban ecosystems to deliver all the services we need, we do know that more nature is good for people and urban living and that arranging it in certain ways can deliver certain specific benefits. We can't achieve this by doing nothing - positive interventions are required, which in turn demand enabling policy, community action and practical delivery mechanisms.

The Green Minds understanding of Urban Wilding recognises the need to shift from nature conservation to nature recovery - to focus on restoring much of what is rare or has gone and a recognition that we need to bring high quality Nature into places where people live.[4]

The Urban Wilding Principles below are designed as a set of prompts to help guide initiatives for nature to thrive in cities: to survive and reproduce, to expand, and to function as a system and so deliver more and better services to support urban environmental health, our economy, and human wellbeing.

*We have chosen to use the term 'wilding' instead of 'rewilding', as it better reflects the reality of nature in urban areas - to rewild implies a return to nature before urbanisation, which is not possible.

[1] Nature Recovery for Our Survival, Prosperity and Wellbeing: A Joint Statement by the Statutory Nature Conservation Bodies of the UK. jncc.gov.uk/our-role/the-uk/nature-recovery-joint-statement

[2] Dasgupta, P. (2021). The Economics of Biodiversity: the Dasgupta Review. London (HM Treasury); Maller, C. (2018) Healthy Urban Environments. Routledge

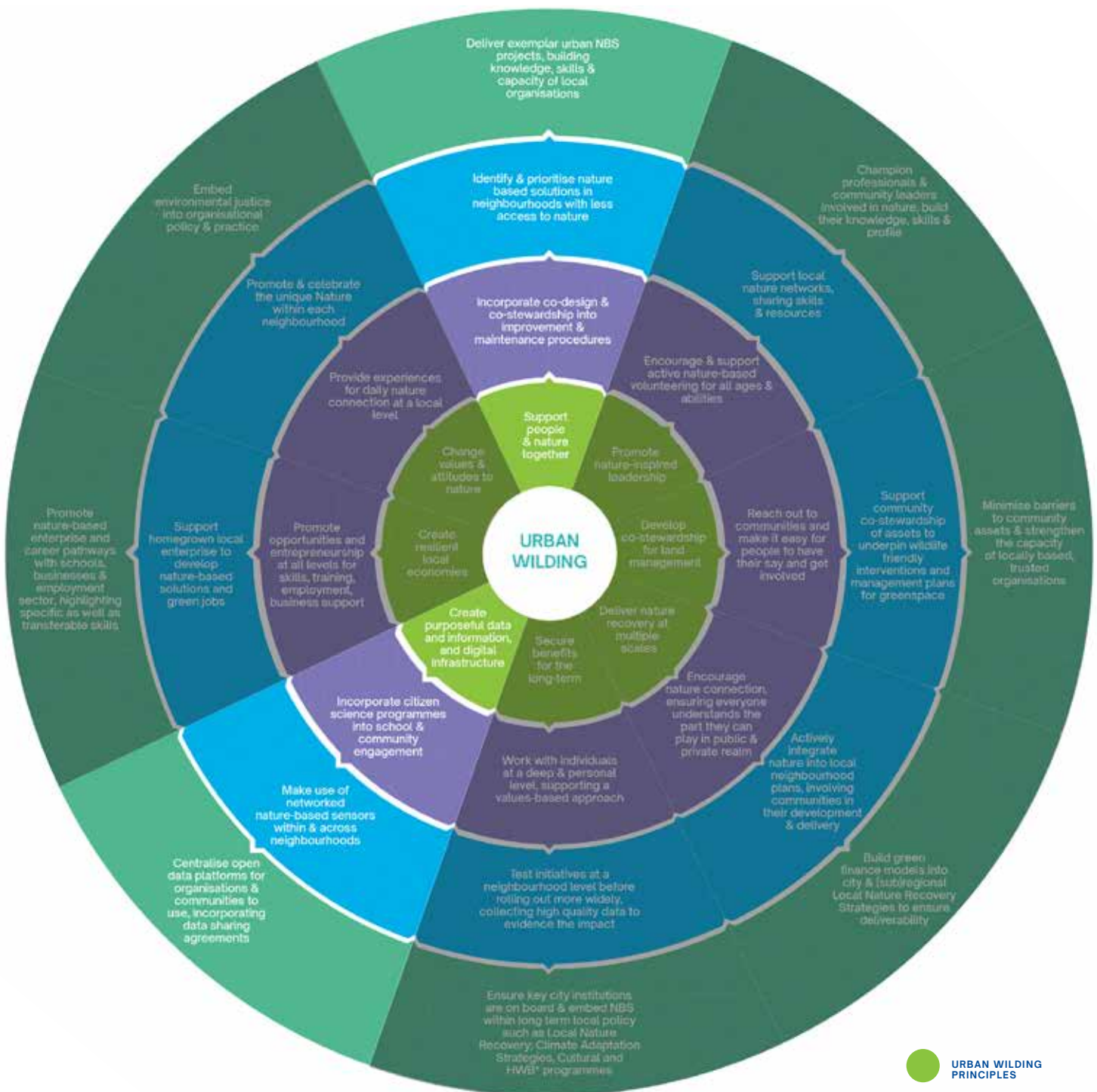
[3] Maller, C., Mumaw, L., & Cooke, B. (2019). Health and social benefits of living with 'wild' nature. Ch 9 in Rewilding. Pettorelli, N., Durant, S., and du Toit, J. (eds). Cambridge University Press

[4] Juniper, T. (2022) Tony Juniper: Green Paper - an opportunity for an integrated approach to Nature recovery - Natural England

greenmindsmodel

The model illustrates the three system levels at which the Urban Wilding principles are applied to drive action: the individual, with neighbourhoods, and within organisations.

Permeability, both within and between segments, reflects the need for adaptability through local learning gained through an action learning approach, in which lessons learned influence the next cycle of implementation.



- URBAN WILDING PRINCIPLES
- INDIVIDUAL BEST PRACTICE
- NEIGHBOURHOOD BEST PRACTICE
- ORGANISATIONAL BEST PRACTICE

Urban Wilding Principles

Support people and nature together

Promote a just transition to wilder cities through equitable access to nature, socially just policy and involvement in the co-creation and co-stewardship of nature-based solutions that are adapted to climate change, biodiverse and support nature connection.

Promote nature-inspired leadership

At all levels of management (individual, community/neighbourhood, city administration, business, etc) enable nature positive actions to enhance urban liveability through education, training, and policy.

Develop co-stewardship for land management

Democratise land management and ownership through the development of co-stewardship solutions with user communities, introducing inclusive and empowering processes for engagement, creating community assets, and utilising diverse governance structures.

Deliver nature recovery at multiple scales

Make the most of the local built environment and its scale, acknowledging that no space is too small to be valuable whilst at the same time recognizing that larger green spaces and high degrees of connectivity are key for nature recovery.

Secure benefits for the long-term

Develop integrated policy instruments that embed urban wilding in development practice, led by communities and advised and supported by public administrations to create resilient cities and a population connected to nature.

Create purposeful data and information supported by digital infrastructure

Develop new digital infrastructures to generate community-owned and insightful knowledge of urban nature to support nature connection, and nature-positive policy and practice.

Create resilient local economies

Promote and empower nature-related careers, cooperatives and social enterprise across all sectors, to create new jobs and new value in green and blue infrastructure.

Change values and attitudes to nature

Promote nature connection amongst citizens, to enhance individual and community wellbeing and to foster nature-positive choices.



Introduction

There has been a growing interest in ongoing monitoring of how people, specifically children, engage with outdoor spaces^{1,2}. Understanding how people use and experience the environment around them is crucial to connecting people with nature, improving health and wellbeing, and delivering placemaking that reflects local communities.

Green Minds, therefore, facilitated the inclusion of four nature-related questions in citywide surveys. These questions are in line with national surveys, such as the People and Nature Survey, allowing for direct comparisons to be made between Plymouth responses and national datasets.

This insight paper offers a case study of the four nature-related questions introduced to an annual Student Health-Related Behaviour Survey (SHRBS) given annually to Plymouth school students to identify how young people in Plymouth engage with outdoor spaces.

Interestingly, time spent in nature has been shown to provide additional benefits for children and young people. Research efforts have focused on identifying pathways to Nature Connection specifically for young people, and though there are variations, access to nature and increased Nature Connection for children overall:

- Act as a contributing protective factor for emotional wellbeing for young people^{3,4}
- ‘Promotes their physical and mental health and cognitive performance’⁵
- Correlates with less peer and emotional problems, as well as less hyperactivity and inattention⁶
- Correlates with higher self-reported competence, confidence, connection with others, caring, and character, as well as belief in a hopeful future⁷
- Is more likely to lead to pro-environmental behaviours and environmental knowledge^{8,9,10}
- Provides a greater connection to nature continuing to adulthood⁵

With these findings in mind, as well as the global concerns of climate change and nature depletion, it is increasingly important that as both the children of today, and the adults of tomorrow, local governing bodies understand the ways that their young people are spending time in and connecting with nature.

1 “MENE” Monitor of Engagement with the Natural Environment – The national survey on people and the natural environment: Headline report 2019. In. 2019. Natural England

2 “The Children’s People and Nature Survey for England: 2022 update” In. 2022. Natural England.

3 Huynh, Quynh, Wendy Craig, Ian Jansson, and William Pickett. 2013. ‘Exposure to public natural space as a protective factor for emotional well-being among young people in Canada’, BMC Public Health, 13:407

4 Jackson, S. Brent, Kathryn T Stevenson, Lincoln R Larson, M Nils Peterson, and Erin Seekamp. 2021. ‘Connection to Nature Boosts Adolescents’ Well-Being during the COVID-19 Pandemic’, Sustainability, 13: 12297.

5 Chawla, Louise. 2020. ‘Childhood Nature Connection and constructive hope: A review of research on connecting with nature and coping with environmental loss’, People and Nature, 2: 619-642.

6 Sobko, Tanja, Zhenzhen Jia, and Gavin Brown. 2018. ‘Measuring the

connectedness to nature in preschool children in an urban setting and its relation to psychological functioning’, PLoS ONE, 13: e0207057.

7 Larson, L, E Bowers, and L Stephens. 2017. Connection to nature and positive youth development. Presented at Pathways 2017: Integrating Human Dimensions into Fisheries and Wildlife Management

8 Otto, Siegmund, and Pamela Pensini. 2017. ‘Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour’, Global Environmental Change, 47: 88-94.

9 Cheng, Judith Chen-Hsuan and Marth C Monroe. 2010. ‘Connection to Nature: Children’s Affective Attitude Toward Nature’, Environment and Behavior, 44: 31-49.

10 Berrera-Hernández, Laura Fernanda, Mirsha Alicia Sotelo-Castillo, Sonia Beatriz Echeverría-Castro, and César Octavio Tapia-Fonlle. 2020. ‘Connectedness to Nature: Its Impact on Sustainable Behaviors and Happiness in Children’, Frontiers in Psychology, 11.

Nature Connectedness in Plymouth school surveys

Green Minds and its partners facilitated the inclusion of four nature-related questions in an annual Student Health-Related Behaviour Survey given to Plymouth school students.

These questions were adapted from national surveys including the People and Nature Survey and the Children's People and Nature Survey. There were 3720 responses collected from November 2021 to October 2022.

How long did you spend in the following places in the last week?

Students were given the option to select from the following statements for how much time they spent in nature, categorised into a variety of green, blue, and urban spaces:

3 hours or more

1-3 hours

Up to 1 hour

No time at all

Why do you spend time outdoors?

Students were given the option to select all reasons why they choose to spend time outdoors from a range of options including both motivations for spending time in nature and activities undertaken.

Nature Connectedness

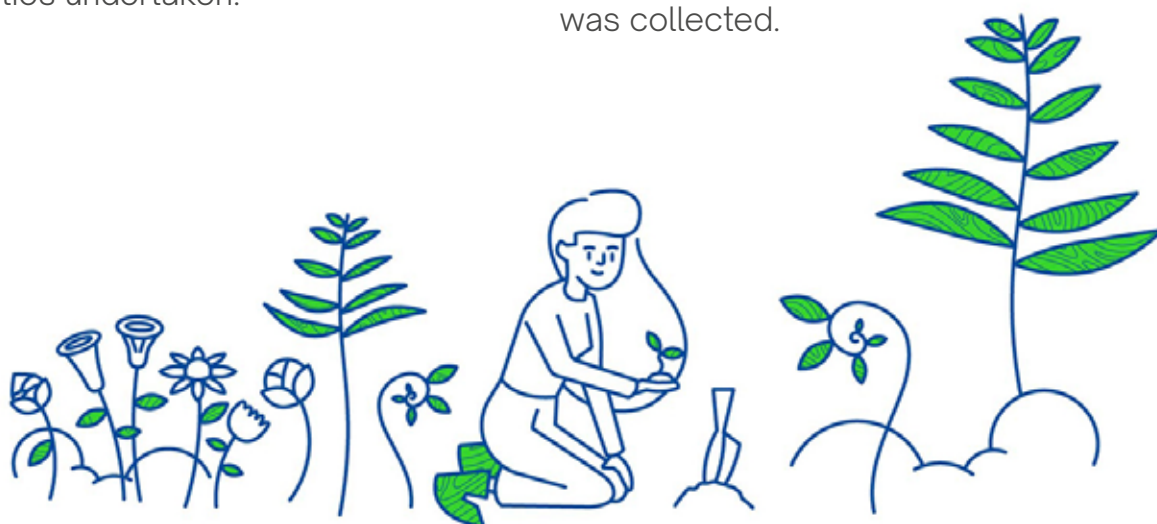
Students were asked to indicate the extent to which they agreed with various statements about their connection to nature.

What are the reasons why you don't spend more time outdoors?

Students were given the option to select all reasons why they do not spend more time outdoors from a range of options.

Comparisons to national datasets

Where relevant, the Green Minds team used this information to make comparisons to the findings from the Children's People and Nature Survey (C-PANS). These comparisons were used to contextualise how Plymouth students engage with their natural environment compared to students across the country. It should be noted though, that whilst similar in theme, there are inherent differences amongst these datasets and regarding how the surveys were designed and how data was collected.



Where do Plymouth school students spend their time outdoors?

25,567 visits were reported to outdoor locations, with 9,068 visits to green spaces and 5,110 visits to blue spaces, within the last week by Plymouth school students.

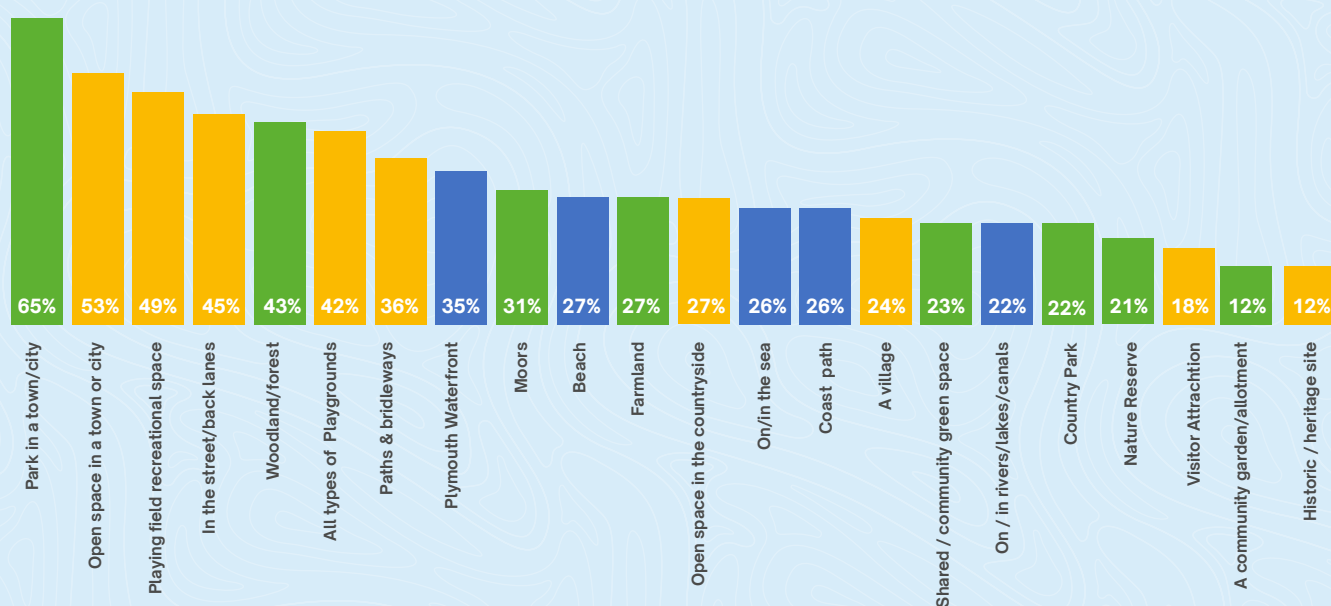
How does this compare nationally?

Similar percentages of students both nationally and from Plymouth reported visiting a park, playing field, or playground.

Plymouth students reported higher rates of visits to woodland or forests, moors, and farmland or other open spaces in the countryside than the national averages.

Plymouth students reported spending a comparable amount of time at the beach, but visited rivers, lakes, or canals more frequently than students nationally.

Breakdown of Plymouth school students reported visits to various outdoor spaces (N=3720).



Graph depicting the percentage of Plymouth school students reported visits to various outdoor spaces (N=3720). Green columns indicate locations classed as 'green' spaces, blue columns indicate locations classed as 'blue' spaces, and yellow columns indicate locations classes as 'urban' or 'other' spaces. Students could provide a response to each statement.

Why do Plymouth school students spend time outdoors?

How does this compare nationally?

The top two reasons why children chose to spend time outdoors (to get fresh air; to play) are the same provided by children in the national survey.

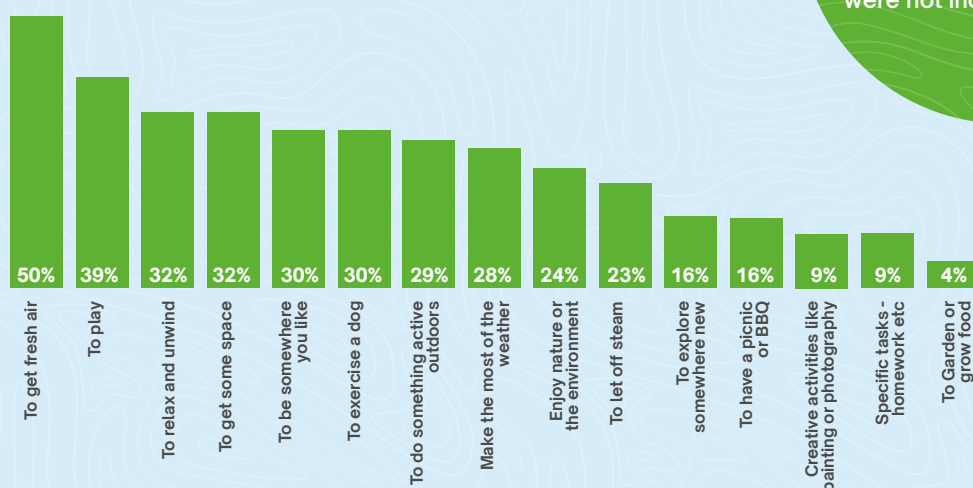
The next two most common responses for both surveys involve relaxing and 'getting some space'.

Nationally, children ranked getting exercise or doing sports higher than those from Plymouth ranked doing something physically active outdoors.

24% of students in Plymouth reported spending time outside to enjoy nature or the environment, compared to 27% of children nationally.

Almost twice as many students nationally reported spending time outside to explore somewhere new or have an adventure.

Plymouth school students (N=3720) reporting why they spend time outdoors.



It should be noted that the two most popular responses from C-PANS, 'to spend time with friends' (55%) and 'to spend time with family' (54%) were not included in SHRBS.

Graph depicting the percentage of Plymouth school students (N=3720) reporting why they spend time outdoors. Students could provide a response for each statement.

Why don't Plymouth school students spend more time outdoors?

How does this compare nationally?

More children nationally reported that they 'just didn't want to' spend more time outdoors. This percentage, which is less than the national average, suggests that a lack of interest is less of a barrier to spending more time outdoors for Plymouth students than it is for those in other areas of the country.

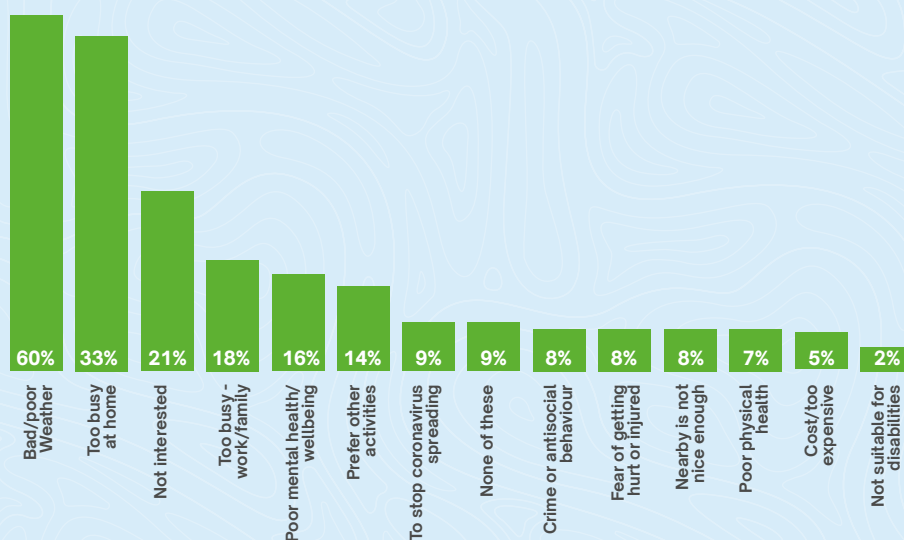
40% more children from Plymouth reported bad weather as a reason for not spending more time outdoors. Being too busy was a common theme both nationally and in Plymouth, either with homework (20%

nationally), at home (33% Plymouth), or with work or family commitments (18% Plymouth).

Similar percentages of children both nationally and from Plymouth reported not spending more time outdoors due to a lack of access to nice locations nearby, a worry about feeling uncomfortable because of other people or antisocial behaviour, or due to poor physical health such as illness or allergies.

Fewer children from Plymouth reported cost or concerns around coronavirus as a barrier to spending more time outdoors than children nationally.

Reasons why Plymouth school students (N=3720) do not spend more time outdoors

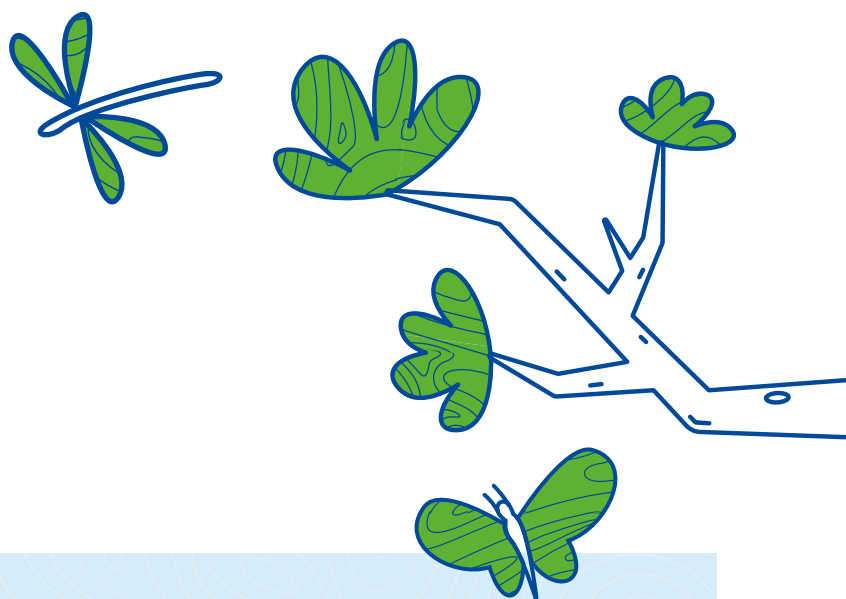


Graph depicting the percentage of reasons why Plymouth school students (N=3720) do not spend more time outdoors. Students could provide an answer for each statement.

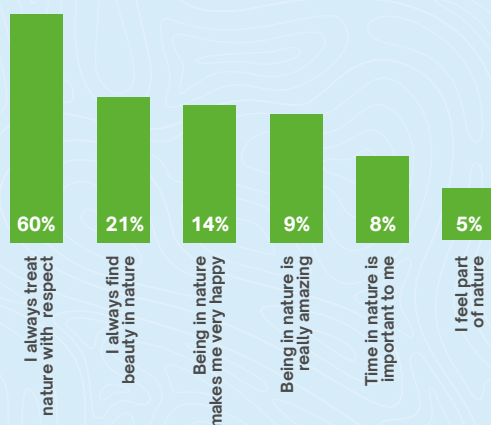
How do Plymouth school students connect with nature?

How does this compare nationally?

38% of Plymouth students agreed that being in nature makes them happy compared to **87% of students nationally**.¹



The percentage of 'Yes' responses to Nature Connectedness questions by Plymouth school students (N=3720)



It should be noted that the assessment of Nature Connection was an area in which SHRBS and C-PANS vastly differed. Therefore, the overall differing themes of the surveys and methods of assessment should be taken into account when viewing these comparisons.

Graph depicting the percentage of 'Yes' responses to Nature Connectedness questions by Plymouth school students (N=3720). Students could provide an answer for each statement.

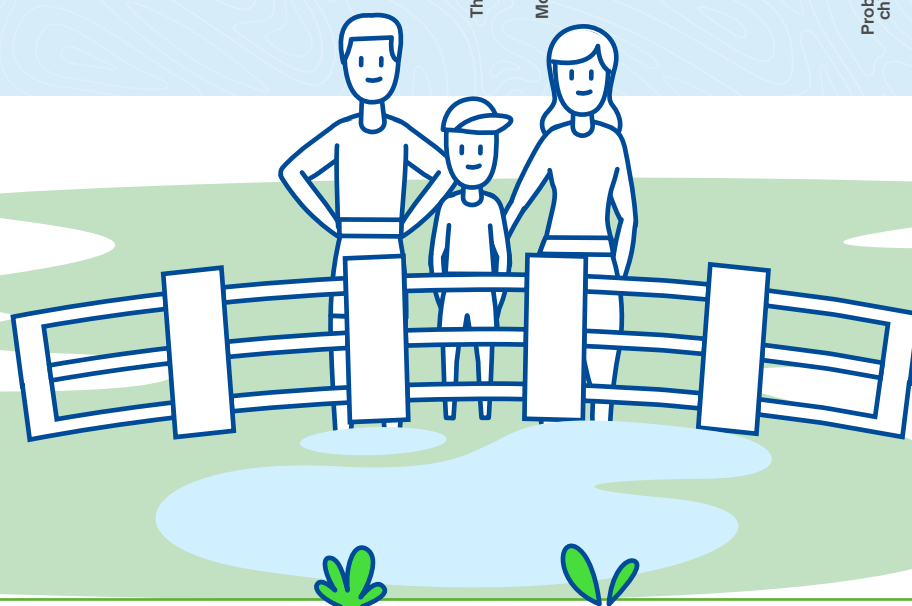
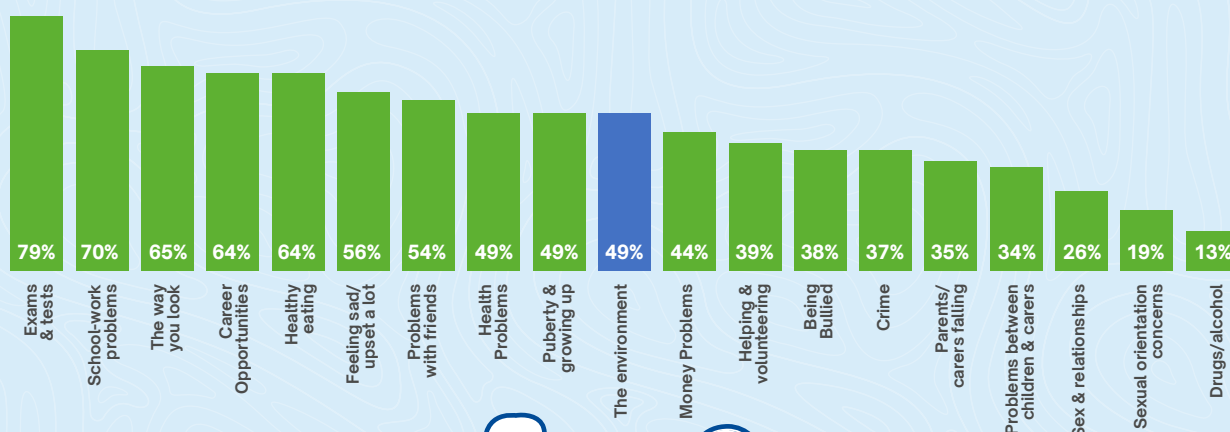
¹ "The Children's People and Nature Survey for England: 2022 update" In. 2022. Natural England.

How much do Plymouth school students worry about the environment?

49% of Plymouth students indicated they worry about the environment either a little, quite a lot, or a lot.

This assessment was not included in C-PANS and therefore there is not an opportunity to compare to national averages.

Plymouth school students (N=3720) indicating degree of worry about various issues



Graph depicting the percentage of Plymouth school students (N=3720) indicating any degree of worry about various issues, including all responses of 'worry a lot', 'worry quite a lot', and 'worry a little'. Students could provide an answer for each statement*. 'Parents/carers not getting on with each other/divorce', ***Problems between children and parents/carers in your family', and ****Thinking you are gay, lesbian, bisexual, or transgender (LGBT)'.

How do students from different neighbourhoods visit outdoor spaces?

Each neighbourhood reported the most visits to urban or other spaces, followed by green spaces, and lastly blue spaces.

Neighbourhood deprivation is likely a contributing factor in students visiting green and urban or other spaces, with more deprived neighbourhoods visiting these spaces less, though no similar trends appear present for visiting blue spaces.

Top & Bottom 5 neighbourhoods visiting outdoor spaces

Green spaces	1. Woodford 2. Somewhere else outside Plymouth 3. Peverell & Hartley 4. Widewell 5. Colebrook, Newnham & Ridgeway	37. Turnchapel, Hooe & Oreston 38. City Centre* 39. Ernesettle** 40. Barne Barton 41. Ham & Pennycross**
Blue spaces	1. Woodford 2. Leigham & Mainstone 3. Morice Town** 4. Devonport** 5. Plympton St. Maurice & Yealmpstone	37. Ernesettle** 38. Goosewell 39. Tamerton Foliot 40. Barne Barton 41. Ham & Pennycross**
Urban or other spaces	1. Woodford 2. Tamerton Foliot 3. Somewhere else outside Plymouth 4. Peverell & Hartley 5. Morice Town**	37. Greenbank & University 38. Ernesettle** 39. Ham & Pennycross* 40. Barne Barton** 41. Turnchapel, Hooe & Oreston

Establishing city-wide Nature Connectedness in school students

How is this information useful for Green Minds?

Gathering local baseline data

The Student Health-Related Behaviour Survey (SHRBS) is repeated annually, therefore enabling Green Minds to continue collecting data over time to monitor changes in how school students interact with the environment. Surveys of this nature are often conducted at a national scale, whereas this survey provides data local to Plymouth and will enable more nuanced policy and practice responses. It will also allow for continued comparisons to the national dataset of the Children's People and Nature Survey to determine if school students in Plymouth have differing connections to nature as a result of various factors such as Plymouth's geography or the influence of organisations and initiatives such as Green Minds.

Delivering future interventions

The responses were also analysed alongside demographic data, therefore identifying leverage points for Green Minds interventions such as neighbourhoods or age groups to target for Green Minds outreach initiatives.

More information on the Children's People and Nature Survey can be found using the following link: <https://www.gov.uk/government/statistics/the-childrens-people-and-nature-survey-for-england-2022-update/the-childrens-people-and-nature-survey-for-england-2022-update>

Moving forward

There were several identified differences amongst SHRBS and the Children's People and Nature Survey. Aligning SHRBS with the Children's People and Nature Survey will allow for more accurate future comparisons. Notably, the Children's People and Nature Survey assessed Nature Connection through a series of pictures in which two circles – one depicting nature and the other a person – overlapped to varying degrees. Children used this visualisation to indicate the level of connection they felt with nature. Where there appears to be a large difference in the level of Nature Connection reported by Plymouth students and national reports, adopting this manner of questioning in future iterations of SHRBS may provide more accurate results.

BELOW: Green Minds supported theatre performance in Devonport Park.

43% of Plymouth students reported visiting a woodland or forest in the last week compared to 27% of students nationally¹

¹ "The Children's People and Nature Survey for England: 2022 update" In. 2022. Natural England.





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