

Children's perspectives on quality in local natural outdoor spaces

Research to co-create a quantitative measure for children and young people

December 2022

Natural England Commissioned Report NECR461



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Candice Satchwell, Rebecca Nowland, Cath Larkins, Jacqueline Dodding, Joanne Harris, Suzanne Wilson, Zoe Bullivant, and Joel Pound



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Project details

This report should be cited as: Satchwell, C., Nowland, R., Larkins, C., Dodding, J., Harris, J., Wilson, S., Bullivant, Z., & Pound, J. (2022). Children's perspectives on quality in local natural outdoor spaces: Research to co-create a quantitative measure for children and young people. Natural England Commissioned Report NECR461.

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Keywords

Children; young people; perceived quality; nature; green space; natural environment; co-production; participatory.

Acknowledgements

We would like to thank all children and young people from all the schools and groups that took part in the research. They were invaluable to every stage of the project.

Many thanks to Helen Kendall (Natural England) and Ruby Grantham (Natural England) who reviewed the report and provided helpful feedback on the draft.

Further information

This report can be downloaded from the [Natural England Access to Evidence Catalogue](#). For information on Natural England publications contact the Natural England Enquiry Service on 0300 060 3900 or e-mail enquiries@naturalengland.org.uk.

Executive summary

Children's views on their local natural environments are rarely sought. Natural England commissioned this research to better understand how children judge the quality of their local natural environments. Specifically, the aim was to use the research to develop a measure of perceived quality in local natural outdoor spaces to be used in Natural England's 'Children's People and Nature Survey', C-PANS. Working with children and young people as co-researchers over a nine-month period, this project aimed to find ways for 8 to 15-year-olds to rate the quality of outdoor spaces.

Participatory research was undertaken with 93 children and young people from eight schools/groups across England to identify features they valued in natural outdoor spaces. Alongside a systematic review of relevant literature, the findings from the qualitative work with children and young people were used to co-create a measure of the quality of natural outdoor spaces.

The overarching research questions were:

1. How do children and young people judge quality in their local natural outdoor spaces?
2. How can we measure quality as perceived by children and young people in their local natural outdoor spaces?

These questions were addressed through four main project stages:

1. A systematic review of existing literature.
2. Qualitative research with children and young people: a child-focused civic hackathon comprising four workshops in eight different settings.
3. Development of a co-created quantitative measure based on children's perspectives.
4. Piloting of the measure with a wider audience of children and young people.

The systematic review identified 21 articles that involved children's perspectives on quality of natural environments, but no existing measure of quality for children.

The qualitative research combined face-to-face arts-based workshops in each setting, with interactive online workshops to share the perspectives of children and young people in different parts of the country. Children were positioned as experts in addressing the problem that 'No-one really knows what children think about the natural outdoor spaces they visit.'

Through artwork and discussion in and across the groups, a rich array of data identified a wide range of items reflecting what children liked and disliked in natural outdoor spaces. Children co-analysed these data to arrive at a thematic framework (Figure 1) reflecting aspects of the natural environment that are important to them.

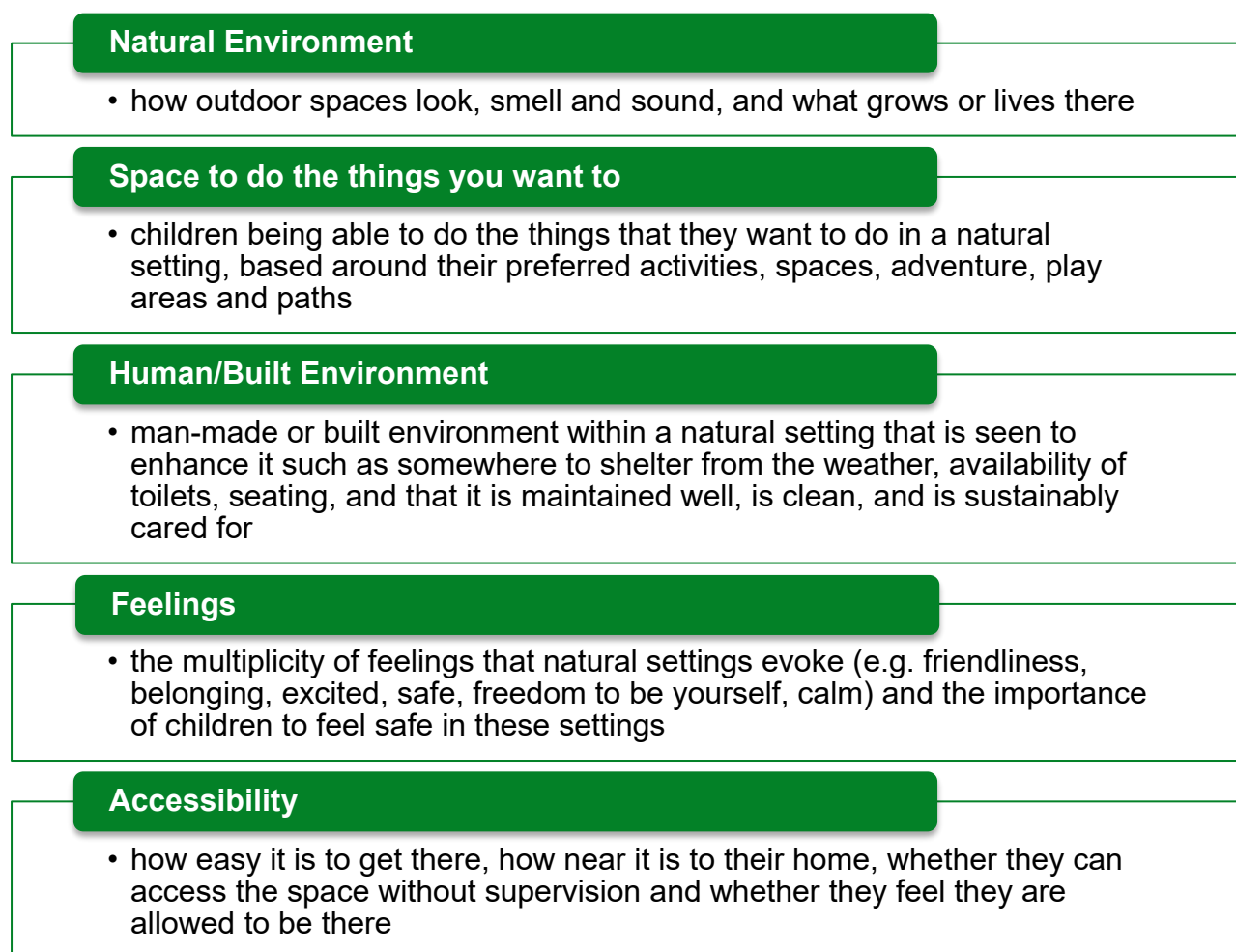


Figure 1: Co-created thematic framework

This framework led to a set of 40 questions which were co-written with children and young people, with 6-8 questions per theme. This measure was trialled with approximately 170 children in a survey that also included short, validated child measures of 'Nature-connectedness' and 'Well-being'. The results were analysed for validity. After cross-checking with qualitative findings and feedback obtained from children, a final set of 12 questions were identified.

The research revealed insights into children's perceptions of the quality and value of natural outdoor spaces. These findings included the importance of diversity of plants and animals, looking after nature, space for play and activity, a sense of belonging, safety, peace and calm, and ease of access. Children and young people made links between experiences of nature and other aspects of their lives, providing important information for all those involved in children's well-being, education, and access to natural outdoor spaces.

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Foreword

Natural England commissions a range of reports from external contractors to provide evidence and advice to assist us in delivering our duties.

Natural England commissioned this report to build its understanding of children and young people's experiences of local natural environments, and to inform the development of its Children's People and Nature Survey.

The views in this report are those of the authors and do not necessarily represent those of Natural England.

Terminology

Children and young people: This terminology is usually used to describe people up to the age of 18. Therefore relevant previous literature considered as part of this work included those aged <18. However, for the purposes of the primary research, the age range targeted was 8 to 15 years old, in line with the 'Children's People and Nature Survey' (C-PANS). This is because people aged 16+ can complete Natural England's adult's 'People and Nature Survey' (PANS)¹; while children younger than 8 would be unlikely to complete a survey independently.

Natural outdoor spaces: The definition of 'natural outdoor spaces' in this project is based on the definition used for 'green and natural spaces' with participants in [PANS](#), and includes green spaces in towns and cities (e.g. parks, canals), the countryside (e.g. farmland, woodland, hills and rivers) and the coast (e.g. beaches, cliffs) and activities in the open sea. Participants are asked to exclude their garden when thinking about these natural outdoor spaces.

Local: For the purposes of this research, the definition of 'local' complies with the [GI standards](#) which describe 15-20 minutes as the average time people walk to get to green space, and PANS adult data which suggests that the majority of people travel less than one mile or between 1 and 2 miles, with 70% of people saying their last outing to a green and natural space was on foot. [C-PANS data](#) also indicates that children spend much time in outdoor spaces close to home, such as parks, playing fields, playgrounds and grassy areas in the streets near them.

¹ <https://www.gov.uk/government/collections/people-and-nature-survey-for-england>

Quality: The notion of ‘quality’ was central to this project, and yet this is a term that is unlikely to be one that children would use. For this reason, and because quality is largely subjective, ‘perceptions of quality’ were inferred through children’s descriptions of what they liked or disliked in outdoor natural spaces, and their preferences in the design of imagined or real outdoor spaces.

1. Introduction

Natural England commissioned this research to better understand how children judge the quality of their local natural environments. Specifically, the aim was to use the research to develop a measure of perceived quality in natural environments to be used in subsequent waves of Natural England's 'Children's People and Nature Survey', C-PANS.

The project included reviewing existing literature on children's perspectives on natural environments and conducting empirical research to gain the perspectives of children and young people aged 8-15 on the quality of their local natural environments, and aspects that were important to them in determining quality. The insights gained from this work were used to co-create with children a set of questions/statements designed to measure the perceived quality of natural environments.

A systematic review of existing literature was conducted to (a) inform the qualitative workshops and (b) ensure that the co-created measure was informed by existing measures and evidence from the literature on children's perspectives of quality in natural environments. The qualitative research involved a series of five different workshops held with children from eight diverse settings (7 schools and one scout group) across the North-West (NW) and South-East (SE) of England. The approach was conceived as a 'child-focused hackathon', with a combination of face-to-face workshops in each setting, and online workshops where children from different settings came together to discuss and vote on different ideas (see Section 3 for details). A children's advisory board was convened to oversee all stages of the research.

The research took place over a 9-month period from October 2021 to June 2022, conducted by a team led by the Centre for Children and Young People's Participation at University of Central Lancashire (UCLan) in NW England with support from Dialogue Matters (DM) in SE England. The Centre for Children and Young People's Participation specialises in putting children at the centre of research about issues which concern them, and its members conduct interdisciplinary research using participatory methodologies which allow co-creation of knowledge and outputs. Dialogue Matters are experts in designing effective dialogue processes which empower and enable participants. For this project, Dialogue Matters gave input into the design and delivered workshops with young people in the South-East of England. The research project team included members from a range of disciplines, including sociology, education, linguistics, childhood studies, media, psychology, environment and health. The resulting project drew together expertise in both qualitative and quantitative approaches, working together with children to collect data on what is important to them about outdoor spaces, what they like and dislike, and how 'quality' of outdoor spaces can be measured according to children's perspectives.

By incorporating schools/groups in different parts of England we aimed to collect a range of responses from children with differing access to and experiences of outdoor spaces, and those whose local areas were comprised of different kinds of landscape: coastal, inland, rural, urban, city. We worked with schools to ensure representation from diverse ethnicities and genders, children with disabilities or learning needs, and those with other challenges in their lives.

Using participatory methods, we worked with children to ensure that the co-created measure reflected what children consider to be important elements relating to a good quality natural environment. Using these methods we also ensured accessibility in formatting and language. The resulting measure was piloted with approximately 170 children to enable assessment of reliability and validity.

Background

While it is well-documented that being outdoors in natural environments has wide-ranging benefits, recent research suggests that it has the greatest impact on children up to early adolescence (Richardson et al., 2019). Early childhood (age 4-7) is thought to be formative for life-long engagement with nature and experiences with nature in the early years contribute to a desire to protect nature (Thompson et al., 2008). Childhood engagement with nature is also known to contribute to mental and physical health (Pearce et al., 2018). Li et al.'s (2021) systematic review of life course nature exposure and mental health outcomes confirms that early exposure to nature has significant benefits for mental health. However, concluding simply that more greenspace is good for health and well-being ignores the wide variation in types and qualities of these spaces. Better understanding of green space quality, how this is perceived by different groups, and how green space planning can be better implemented to provide not only benefit for ecosystems, but also human health and well-being, is needed.

Li et al. (2021, p.12) also note that most of the studies included in their review rely on adults' retrospective self-reporting of their childhood exposure to nature, rather than children's own reporting of their experiences with nature. Building on this more limited understanding of children's perspectives and experiences of the natural environment, the current research aims to better understand children's own perspectives of the quality of the outdoor spaces they visit.

Adults' perspectives on quality

Surveys of adults' perspectives on nature quality have been created, for example by Natural England ([Adult's People and Nature Survey, 2019](#)) and Greenspace Scotland (2008), amongst others (see Knobel et al., 2019 for review). These often use the assumption that quality can be judged on the basis of various attributes of natural spaces including general condition and maintenance, specific features and fitness for purpose (Greenspace Scotland, 2008). In many surveys/assessment tools, quality of natural spaces is therefore judged by the presence or absence

and/or ratings of particular attributes. For example, Giles-Corti et al. (2005) explored perceived quality attributes and activities in green spaces, using a composite index of park attractiveness, incorporating environmental quality, three amenity factors and two safety factors as indicators. Such measures enable an auditing of the quality of parks and natural spaces assessed by independent observers and typically display good inter-rater reliability (i.e. two independent observers make similar quality judgements).

A recent review focussing on auditing tools used to assess urban green spaces conducted in 2019 found 15 such assessment tools for use with adults (Knobel, Dadvand & Maneja-Zaragoza, 2019). These tools varied widely in relation to the (1) focus; (2) design process; (3) “time per visit” and “training time”; (4) number of included items; (5) definition and inclusion criteria; and (6) structure, definition and inclusion of attributes. Included attributes in each tool varied considerably and some dimensions were underrepresented (Surroundings, Usage/Activities, Covers, Policies, Animal biodiversity and Vegetal biodiversity) while others are always present (Accessibility, Facilities, Amenities, Aesthetics and Attractions and Incivilities).

Quality of natural space is also understood in relation to the degree of ‘excellence’ of particular attributes or features, rather than just their quantity, presence or absence (Fongar, Aamodt, Randrup & Solfjeld, 2019). The degree of excellence is based on perceptions and experiences associated with a particular feature or the overall sum of features. Quality in these measures is an overall impression of the excellence of the green space rather than measuring the quality given by indicators; therefore the perceived quality relies on respondents’ judgements of quality. Thus, a further category of measures has been developed that asks people to comment on rating scales relating to particular attributes. For example, a measure designed by Van Dillen, de Vries, Groenewegen, and Spreeuwenberg (2012) asks adults to rate particular attributes such as accessibility, maintenance, naturalness, colourfulness, absence of litter, and safety on a rating scale (i.e., very good to very bad). Other measures use single item statements such as “how do you perceive the quality of green spaces in your municipality?” and respondents are asked to rate on a scale from ‘very bad quality’ to ‘very good quality’, allowing for an overall judgement of the quality of green spaces (see for example, Fongar et al., 2019).

Asking children

The review identified three tools that focused on quality of urban green spaces to provide physical play for children and adolescents (Bird et al., 2015; Jenkins et al., 2015; Timperio et al., 2008). Timperio et al.’s (2008) public space audit included assessment of the number of recreational grounds, playgrounds and amenities; presence of walking/cycling paths and lighting along the paths; presence of trees providing shade; presence of a water feature; presence of signs about dogs in the space and presence of signage restricting other activities. Bird et al.’s (2015) park

quality tool included 5 conceptual domains that were considered to be important for adolescents: 1) Activities, 2) Environmental Quality, 3) Services, 4) Safety, and 5) General Impression. Jenkins et al. (2015) devised a Playable Space Quality Assessment Tool (PSQAT) to measure Location, Play Value and Care and Maintenance. As is common, these auditing tools were designed in consultation with adult experts to be completed by adult observers.

There have been a few perceived quality measures designed that focus on subjective perspectives of excellence of a natural space in relation to impacts on children. These have used parents' reporting of quality of green space for children and associations have been found between parents' perceived quality of natural space and children's health and well-being. This was the case in two studies by the same authors (Feng & Astell-Burt, 2017a; 2017b) in which parents were asked to respond to a single item – 'there are good parks, playgrounds and play spaces in this neighbourhood'.

There is currently no measure of perceived quality of natural environments for use by children that reflects their perspectives on the important aspects or features of a natural environment. The current research therefore aimed to address this gap.

Research Questions

The overarching research questions are:

1. How do children and young people judge quality in their local natural outdoor spaces?
2. How can we measure quality as perceived by children and young people in their local natural outdoor spaces?

These questions are addressed through four main project stages.

1. Systematic review of existing literature
2. Qualitative research with children
3. Development of a quantitative measure
4. Piloting of the measure

This report presents each of the four project stages, including their specific aims, methods and results/findings sections.

2. Systematic Review

Aims

The systematic review was conducted to inform and complement the other stages of the project. Specifically, it aimed to answer the following questions:

- What are children and young people’s perceptions of the features that are important for a quality natural environment that they can access, engage with and enjoy?
- How have children and young people’s perceptions of natural environment quality been measured?

The focus of the review, search strategy and data analysis plans were developed from a rapid scoping review conducted at the commencement of the project, and previous participatory work with young people conducted by members of the project team (e.g. Pound, Larkins & Pound, 2019; Satchwell et al., 2020), but also from feedback from the research advisory group and the participatory workshops with children and young people (see section 3). The review was completed in tandem with the participatory workshops, so that while the analysis was inductive, themes identified in the workshops were used to group the review findings, and review findings were used in one of the workshops for reflection.

Methods

Searches and search terms

Database searches were conducted on 25th January 2022, using five bibliographic databases: PsycINFO, SocINDEX, ERIC, CINAHL, and SCOPUS using the following search terms (Table 1):

Table 1: Search terms for literature review

Children	Nature	Quality
“child” or “children” or “kid” or “kids” or “girl*” or “boy*” or “adolescen*” or “teen*” or “youth*” or “young people” or “young adult” or “young person” or “young men” or “young women”	“natural environment” or “green spaces” or “blue spaces” or “greenspace” or “bluespace” or “nature” or “landscape” or “woodlands” or “wildland” or “natural spaces” or “outdoor spaces” or “outdoor places” or “outdoor environment”	“quality” or “qualities” or “environmental features” or “perceptions” or “perspectives” or “preferences” or “views” or “conceptions” or “perceive” or “define” or “definition*”

To locate wider grey literature on children’s perspectives on the natural environment, Google searching and an examination of key organisations’ websites (e.g. River Trusts, Coastal Projects, National Parks England and UK; full list of organisations searched is in the appendices) was also conducted.

Searches were restricted to publications dated 1990 to 2022 because initial scoping searches revealed relevant publications tending to have been published from early 1990s onwards.

Table 2: Inclusion and exclusion criteria for literature review

	Include	Exclude
Participants/ population	All children up to the age of 18 years old	People over the age of 18 years
Intervention/ exposure	Natural environment - non-human-made physical surroundings and conditions in which human life takes place, including ecological units that operate as natural systems (e.g. soil, vegetation) and universal natural resources (i.e. air, water). Including natural spaces in a school setting, buildings, and parks.	The built environment which refers to areas that have been fundamentally transformed and influenced by human activity (i.e. cities, towns). Outdoor space and/or neighbourhood where natural environment is not discussed separately. Private gardens.
Comparator/ control	Comparisons between children living in different spaces (i.e. geographical region, country, urban/rural) and/or have different access to natural spaces	N/A
Outcome	Children's perceptions (e.g. important features, qualities etc.) of the natural environment and their perceived health and well-being impacts and associated measurement tools/scales.	Parent/teacher or other adult reporting of children's perspectives and/or experiences. Children's perspectives on climate change and/or education on the importance of the natural environment exclusively. Children's belonging to or connection to nature exclusively.
Study types	All study types in peer reviewed journals, grey literature reports, books and book chapters.	Reviews, editorials, erratum, commentaries, dissertations.
Language	Written in English language.	Written in a language other than English.
Country	Any country.	N/A
Date of publication	1990-2022.	Published before 1990.

Data extraction and analysis

Key information was extracted from the selected studies including key study characteristics, descriptions of children, type of natural setting, the aims of the study, study design, perceptions of key elements and/or influences on quality natural environments, impacts on quality, and perceptions of impacts on well-being.

Data from studies was analysed using thematic analysis (Braun & Clarke, 2006), with a combined approach of inductive coding and collating of inductive codes around themes co-produced with children from participatory workshop activities. Data was then synthesised with a textual analysis using the co-produced themes.

Findings of systematic review

Included articles

Figure 2 displays a schematic of the flow of included articles in the review process. Twenty-one studies were deemed to meet the inclusion criteria and were included in the synthesis. Full reference list of included studies can be found in Appendix 2.

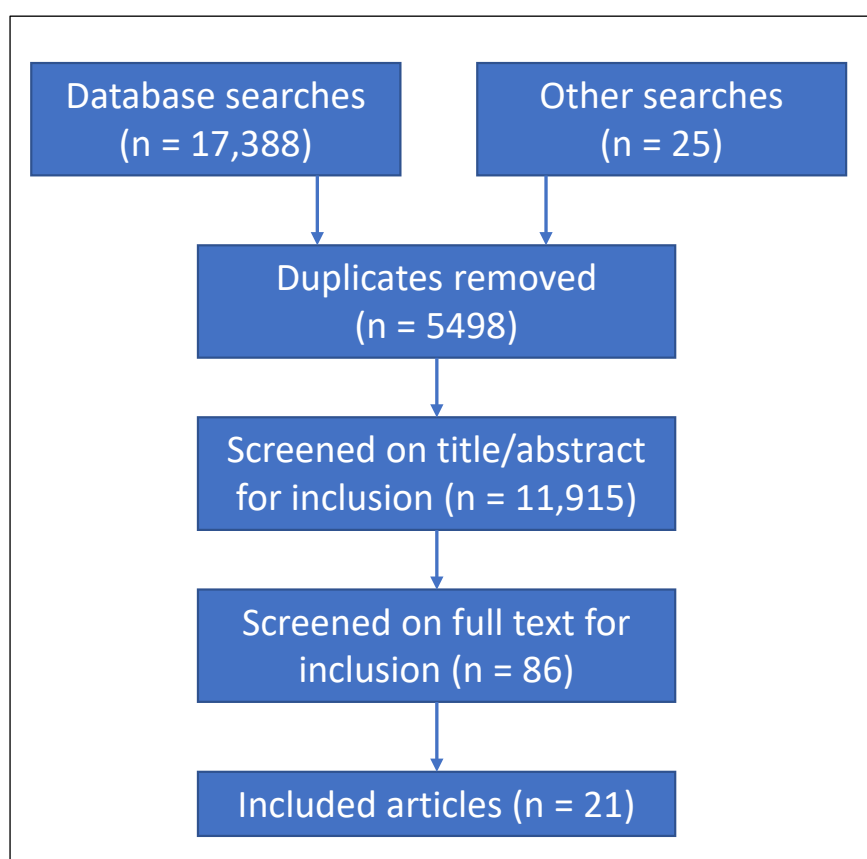


Figure 2: Flow of included articles in the review process

Appendix 1 displays descriptive information about the included studies. Although the intention was to include any study design, only studies using qualitative methodologies were found. We also found no child measures of perceived quality of

natural environments. Studies where perceived quality was examined in relation to children often used parent reporting of their perception of the quality of the environment for the child (e.g. Feng & Astell-Burt, 2017a; 2017b) or adult ratings of natural environments (e.g. Bird et al., 2015; Jenkins et al., 2015; Timperio et al., 2008) and were not included as these did not fit the inclusion criteria (i.e. were adult perceptions). All included studies were qualitative, typically using focus groups or interviews, with one being a collaborative student-led project (Douglas, 2016) and another being a philosophical inquiry (Payne, 2014). Most of the studies involved participatory and/or creative methods such as drawing, writing, taking photographs, with some including a walking (Jansson & Lerstrup, 2021) or mapping activity (Tapsell, 1997).

The majority of the studies were conducted in the UK (n = 6) or the USA (n = 5). Other studies were conducted in Australia (n = 2), South Africa, Canada, Czech Republic, Malaysia and Germany. Two studies were cross-national and compared two countries: Canada and Slovakia; and Sweden and Denmark.

We did not find any studies that explicitly discussed quality of natural environments with children, although there were two that explicitly discussed preferences for natural spaces (see aims of studies in Appendix 1). Most of the included studies did not directly ask children about quality but examined their perceptions and/or experiences of nature (n = 15) and were included because quality could be inferred from children's discussions, and/or the discussions noted important features valued by children. Many studies asked children more generally about their perceptions of the natural environment, but twelve (57.14%) asked children to discuss a specific place. The focus of these twelve studies about specific locations varied from using photographs of specific places (Simmons, 1994), asking children about their general neighbourhood (Douglas, 2016), a particular park or natural area (Bell, Thompson, & Travlou, 2003; Gidlow & Ellis, 2011; Mahidin & Maulan, 2010; Tapsell, 1997; Von Benzon et al., 2017; 2018), or specific areas were chosen by children (Jansson & Lerstrup, 2021; McAllister, Lewis & Murphy, 2012; Payne, 2014; Raith, 2017). Two of the studies focused specifically on access to natural spaces by children (Bell, 2003, Douglas, 2016). One was an evaluation of a project to promote use of a park (Gidlow, 2011), and another examined the role of green space in children's perceptions and preferences for a Child Friendly City (Jansson & Lerstrup, 2021).

In relation to children involved in the studies, most recruited school children in the specific geographic areas of focus for the research. However, some studies gave very little detail about the participants involved apart from gender and age (see Appendix 1). Three studies noted that they included only children from low socioeconomic status (SES) backgrounds (Adams & Savahl, 2015; Adams, Savahl, Florence & Jackson, 2019; Gidlow & Ellis, 2011) and another highlighted that the study involved low SES children (Blanton et al., 2013). Three studies highlight the ethnic diversity of participants (Aaron & Witt, 2011; Blanton et al., 2013; Douglas,

2016;). Three involved a comparison between children living in urban or rural areas (Bonnett, 1998; Jansson & Lerstrup, 2021; Wals, 1994).

Thematic analysis

The data extracted from the selected papers were coded inductively and then grouped using the thematic framework co-developed with children in the participatory workshops in the current project (see Section 3 for details). These workshops had in turn been informed by early scoping searches of the literature. Table 1 displays the final co-created themes and the associated inductive codes. All the data coded were merged around each theme.

Table 3. Themes co-created with children mapped to inductive codes

Co-created Theme	Inductive coding
Natural Environment – how outdoor spaces look/smell/sound, what grows or lives there	Natural elements Aesthetic/sensory
Space to do the things you want to– activities, spaces, adventure, play areas, paths	Functions/affordances
Human/Built Environment – shelter, toilets, seating, clean, sustainably cared for	Facilities Maintenance/conservation
Feelings – friendliness, belonging, excited, safe, freedom to be yourself, calm	Safety, fear, feelings in nature, peace
Accessibility – easy to get there, allowed to be there, near enough to home	Access

A narrative synthesis relating to each of these themes follows.

Natural Environment

Studies of children’s preferences about nature highlight an interplay between the utility and beauty of nature. For example, children noted natural elements and features, such as trees and animals when discussing what they liked about natural settings. Trees were commonly photographed by children, who when asked why chosen, often gave reasons centred around feelings or affordances:

‘it looks like a buffalo with a big horn and I can climb and sit on the branch’.
(Mahidin & Maulan, 2012)

it 'looks very green; I like the grass and trees, birds, little paths, and little trees', that there was lots of room to play and places to hide' (Simmons, 1994)

But also, there was some acknowledgement of the aesthetics and the importance of a “pretty view” (Simmons, 1994), children were interested in the shapes and colours of trees and “amazed with the animals’ appearance” (Mahidin & Maulan, 2012).

Some children reported the enjoyment they find by “walking through the woods and observing stuff” (Blanton et al., 2013).

Although most children discussed the beauty of nature relating to the visual aspects, such as the many different colours of nature, sunsets and presence of flowers, plants, trees and animals, some discussed the sounds of nature, focussing on sounds of birds and buzzing insects (Raith, 2017). A “smaller number of students responded to the textures and smells present in their nature settings” (Francis, Paige & Lloyd, 2013). In one study conducted in Denmark and Sweden:

‘curiosity of children was not restricted to viewing and listening, but also included senses of touch, smell and taste. During the walks, several tasted and chewed things such as leaves, fruits etc. Others, mainly in the Swedish case areas, talked a lot about fruit trees and picking fruits and berries from trees, which were seen as beautiful and useful for both play and food’ (Jansson & Lerstrup, 2021).

Children did, however, often show preferences for man-made scenes and/or highly structured, landscaped natural settings and structured play spaces, e.g. playgrounds. One author concluded that, “these preferences may indicate that the students do appreciate natural elements, but in an organized, ‘usable’ format” (McAllister, Lewis & Murphy, 2012).

Children valued variation in natural settings with a variety of natural elements:

‘Children enjoyed all kinds of landscapes and wanted open spaces as well as enclosures, evenly paved ground as well as grassy slopes, short grass for ball games for hiding and supporting animal life, cultivated plants such as fruit trees and berries as well as flowers and wild herbs. ... The wish to construct, explore, observe and talk underlined children’s curiosity and appetite for something new to happen, something new to experience, explore and reflect on.’ (Jansson & Lerstrup, 2021)

Space to do the things you want to

Children typically made judgements about a natural space based on the affordances it offered to them; ‘their evaluation of places was heavily conditioned by what they felt they could do there’ (Bonnett & Williams, 1998) and ‘the agency of the environment to provide for a particular need, as directly experienced ... as being valuable to the young person in some way’. (Von Benzon, 2018).

‘The woodland was described as “good for tree houses” and “a place where loads of kids would go and play hide and seek”. The meadow was seen as being less suitable for playing in, as running around would involve trampling on the long grass and wild flowers.’ (Bonnett & Williams, 1998)

Bridges and pathways were important to children, often evident in their drawings, as providing access to spaces and for particular activities such as cycling and roller skating (Tapsell, 1997). For some the paths in natural spaces provided potential activities themselves:

'we could take the path to see different animals', 'we could follow the mysterious passages', and 'read the signs to learn the names of the trees'. (Simmons, 1994)

Others highlighted the social aspect of a natural setting offering places for socialising, spending time with family (Francis, 2013) or walking their pets (Payne, 1998).

'Positive aspects of the park that young people identified were related to socialising, "the people that go down there"; and the youth workers who visited the park, "the youth people, we look forward to that".' (Gidlow & Ellis, 2011)

Human/Built Environment

Children often talked about facilities in natural environments in their discussions about their preferences, e.g., playgrounds, football cages, basketball courts, climbing frames or play equipment (Raith, 2017; Simmons, 1994). Suggestions for improvements often centred on these facilities:

"I like the cage... it's good." Although recognised by both adults and young people as one of the best and most popular facilities in the park, suggestions for improvements mostly concerned "the cage": "when it rains we are dead cold like, put a roof on the courts then we can play football"; "we need lights round the court because it gets dark early now and we can't play"; "there is glass in [the cage]... and when it's wet it's dead slippery". (Gidlow & Ellis, 2011)

The importance of having somewhere to shelter from the weather (e.g., cold and rain, Simmons, 1994; Gidlow & Ellis, 2011) was often highlighted.

Children expressed a desire for equipment to be age-appropriate with some expressing that they felt there were no facilities at the park for their age group: "it's all for babies" (Gidlow & Ellis, 2011).

'Between the lines, children expressed the feeling that their age group was not considered as important as younger children or adults. Settings that they preferred were often not well-kept or were even removed. Children complained about old play equipment being replaced with something less interesting and intended for smaller children, or not being replaced at all.' (Jansson & Lerstrup, 2021)

Other children highlighted the importance of having a picnic area and benches, access to a 'water fountain for when you get thirsty' (Simmons, 1994).

Commonly discussed across the studies by children was the maintenance of play equipment and natural features:

'The trees were seen to provide some shelter, but thought to be in poor condition: "there's glass bottles in there what people chuck... smashed all over the place... and the grass doesn't get cut very often". The young participants

saw the trees as a source of shelter that was badly treated and maintained' (Gidlow & Ellis, 2011)

Another aspect of maintenance of natural settings that was commonly discussed was vandalism and graffiti:

'young people recognised that the little existing equipment had been vandalised: "it's all graffitied and everything and broke", and that new equipment might be treated similarly: "it'd get ruined anyway" and might be targeted by other groups that use the park: "the smack heads that come down".' (Gidlow & Ellis, 2011)

However, there were mixed views about graffiti across the studies. Distinctions were made between "good" and "bad/ugly" graffiti and opportunities to work with local artists to create graffiti artwork was suggested by some as an intervention to protect the park and prevent vandalism.

Children reflected an understanding of a need to look after and/or protect nature and took responsibility for this; "gotta help keep nature clean" and "keep people from messing the trees down and breaking them." (Aaron & Witt, 2011)

Litter was commonly discussed but not always considered a problem, with some children finding it 'fun to find litter items, while dumped waste, dog waste and cigarette butts, waste associated with adults, were generally disliked' (Jansson & Lerstrup, 2021). Children also discussed the importance of recycling and conservation and highlighted the need for a good natural space to be free of pollution, often expressing strong concerns about wildlife and wildlife habitats (animals' 'homes') (Tapsell, 1997):

"Because since there's no air pollution, animals like to go in there, and if you're really quiet you can sometimes see or hear animals and you can just walk and enjoy the nature" (girl, sixth grade). (McAllister et al., 2012)

In some studies children complained that there seemed to be a lack of consideration of children in planning and maintenance, noting "insensitive maintenance" of vegetation, e.g. that shrubs used for hiding were pruned back too hard, grass was cut too short and interesting vegetation structures taken down. In several cases, children reported felling of beloved trees used for climbing, swinging or sitting in the shade reflecting and listening to the birds' (Khan, 2021). Children also enjoyed leaving their mark on the natural setting with displays of petals or stones and enjoyed fallen leaves on the paths, complaining these were often removed and tidied away unnecessarily (Jansson & Lerstrup, 2021).

Feelings

Often discussed by children were positive feelings about nature; a sense of happiness, excitement, fun and/or general well-being that they felt in nature (Aaron & Witt, 2011):

"I just like it because it gives me a happy feeling because I'm surrounded by trees, dirt and trees" (girl, fifth grade). "There's grass, lots of leaves and the

grass has been sprinkled. It just feels good if you were there” (boy, fifth grade). (McAllister et al., 2012).

For many children natural settings were places of tranquillity, peace and reflection (Aaron, 2011) and they reported feeling calm and relieved when outdoors (Blanton, 2013), just being able to enjoy the fresh air was commonly noted “I just sit outside and just sit there and just, enjoy the air” (Blanton et al., 2013). These feelings were associated with appreciation of the beauty of such places, the quiet and the privacy (Bonnett & Williams, 1998).

“It’s a place where you can feel calm, and like, there is, like, trees and animals, reindeer. And it’s a place where you can go, where is no noise and it’s peaceful. it calms me down like, when I’m like really tense, I’m like mad at something, I can go there and just calm down ... feeling good/happy”. (Donnell & Rinkoff, 2015)

Some expressed that natural spaces provided them a space away from their concerns, pressures and anxieties, to “be alone to think”. (Francis, 2013):

“If you’d just had a row, you could go off and if you sat up there or something you could have a nice view.” (Bonnett & Williams, 1998)

But it was not all just positive feelings about nature that were expressed by children:

‘Fear was also a recognized feeling among children when they were asked about nature. Usually it was fear of the unknown or fear of being without modern conveniences, for example: “I’m not sure what is out there”; “I could get lost or hurt”; “animals could kill me”; “My phone won’t work, I wouldn’t have cell service”.’ (Aaron & Witt, 2011)

Some children also expressed a fear of animals – ‘the fear of animals was the most common reason for feeling scared’ (Donnell & Rinkoff, 2015):

“I don’t like to see the animals out, cuz I’m scared” and “some are vicious.” ... “I don’t like walking home from wherever you were going and then a dog is out loose and starts chasing you home” and “I don’t like the fact that when I go out to play in the morning the goose and the geese take over everything.” (Bonnett & Williams, 1998)

Social threats were typically discussed in relation to their feelings of safety and expressed fears about ‘being observed constantly’ (Payne, 1998). Children highlighted too that natural settings could be isolated ‘providing criminals with the opportunity to engage undetected in illicit activities’ (Adams, 2015).

Evident from children’s discussions was the importance for them to feel safe in natural settings, with a few of the authors highlighting safety as a prominent theme or running through all of the themes (Adams, 2015):

‘[safety] emerged as the critical lens through which children made sense of and gave meaning to their engagement with the natural environment. This notion of personal safety was embedded in every theme and aspect which the study elucidated, and can be considered as a seminal finding.’ (Adams & Savahl, 2015)

For some, natural spaces were an extension of other spaces that they did not feel safe in reflecting their sense of social threats in everyday life for some children:

'natural spaces in the participant's community are not representative of a place of safety from the social threats in their environments. Further, incongruence between the participant's environment and the need for "personal safety as a non-negotiable" may impact on their psychological well-being given the constant threat of violence and danger in their community.'

(Adams & Savahl, 2019)

In some studies children suggested having some spaces specifically designated as 'safe spaces for children, which other community members could utilise as well'.

(Adams et al., 2019)

Accessibility

Across the studies children highlighted a need for freedom and a sense of belonging in natural spaces, but often highlighted limitations they felt with their independence in natural spaces, 'often children reported they did not have choices in their behaviour. Parents usually decided if children were allowed to be outside in nature after school.'

(Aaron & Witt, 2011)

Some highlighted the importance of visiting natural spaces alone:

"the first time I went out by myself it felt like I could be trusted. Now I can go whenever I want". (Francis, 2013)

Children also highlighted access based around physical proximity and safety of getting to a particular natural place, with some having limited access based on proximity of natural spaces (i.e. children living in urban areas). Children preferred familiar spaces and places that are local, "it's close as well, to where we live" (Gidlow & Ellis, 2011).

Some highlighted that the natural spaces that they had locally they couldn't access unaccompanied because they involved crossing dangerous roads:

"There is no sidewalks as we got the ramps [sic]. In order to reach the ramps, we had to walk beside the cars (not like last time where we had to go through the bushes). LD saved me from the car that was about to hit me." (Anna).'

(Douglas, 2016)

Factors influencing perceptions of quality

The selected studies revealed some factors that influence children's perceptions of nature and their opinions about quality. Studies showed some gender differences in appreciation of the aesthetics of nature, with some studies showing girls may place more importance on the beauty of nature (Raith, 2017). This was also the case for children with greater exposure to nature who discussed the beauty of nature more and preferred natural elements to man-made ones (e.g. play equipment) in contrast

to those with less exposure to nature (Francis, 2013). Children from cities and urban areas with less exposure to nature often experienced more fears and anxieties about nature (Aaron & Witt, 2021). There were also differences in preferences based around age, with older children wanting more independence and freedom, preferring areas where they could escape the gaze of adults (Bell, Thompson & Travlou 2003). There was also some indication that older children may have a stronger preference for non-green areas than younger children (Bell et al., 2003). Although these studies indicate some important influences on perceptions of quality of natural settings, more research is needed.

3. Qualitative research with children

Aims

The qualitative research with children aimed to gather insight into children's perceptions of quality in natural environments by working directly with groups of children in a series of workshops.

For the qualitative research stage, specific questions included:

- How do children and young people perceive 'local natural outdoor spaces'?
- What do children and young people like and dislike in natural outdoor spaces?

Methods

The research was designed to be as participatory as possible, using methods that positioned children as 'co-researchers' in that, through advisory roles and as participants, they engaged in dialogue with the adult co-researchers to shape and inform every stage of the project as well as the resulting measure (Larkins, Kiili & Palsanen, 2014). With this in mind, the approach taken for the qualitative research process, conducted via a series of five workshops with children, was to run it as a **child-focused civic hackathon** (Larkins et al., forthcoming). While the original focus for a hackathon was in relation to collaborative design of new software (Yuan & Gasco-Hernandez, 2021), the concept of a civic hackathon has been expanded to include a range of methods for prototyping and prioritising solutions to social challenges. During the pandemic, The Centre for Children and Young People's Participation (in work led by Prof Larkins) developed the concept of a child-focused civic hackathon to respond to a range of social research challenges, including the development of evaluation frameworks. The method involves formation of teams composed of child or youth co-researchers with a dedicated linked adult co-researcher. Teams then take part in a combination of offline and online, in-team and across-team workshops to reflect on their own experiences to respond to a social challenge and develop priorities for prototype solutions.

The rationale for adopting this method in the current study was to position the children as the only ones who can solve the problem posed, which was broadly conceived as: **'No-one really knows what children think about the outdoor spaces they visit.'** During workshops, it was explained to children that by telling us what they liked and disliked about natural environments they knew about or could imagine, they would be helping towards addressing this problem. As the workshops progressed, additional information was provided about the way their contributions would help to create a survey for children in England to give their views. The overall format included both face-to-face and online workshops, which was a deliberate strategy to mitigate against the impact of the ongoing Coronavirus pandemic; to give alternative means of collecting data; to allow children to produce their own creative

responses in small groups; and for children to share their contributions, see those of other children, and to comment and vote on preferred options. The hackathon concept allowed children to feel that they were part of a wider challenge, whereby they could meet other children online from different schools in different parts of the country.

The inclusion of art-based methods was for several reasons: to make the workshops fun and with varied activities; to be inclusive of children who were less adept with oral and written literacies; to provide a stimulus for further discussion; and to capture aspects of children's perceptions that may have escaped purely verbal or written modes of communication. The following 'events' were planned as part of the hackathon:

Hackathon event 1 (face-to-face, local teams): Initial posing of the problem: 'No-one really knows what children think about the outdoor spaces they visit.' Children were encouraged to reflect on outdoor places they visit and to creatively explore imagined outdoor spaces, highlighting features they did and did not like.

Hackathon event 2 (online, national across-teams and face-to-face local in-team discussions): Sharing of children's contributions: Researchers showed all pictures created in previous session by all participating groups. They asked for responses from all groups via synchronous events, to gauge agreement/disagreement and to provoke thinking of additional or alternative features of outdoor natural spaces. In local groups, facilitated by co-located adults, children reflected on the perspectives from other teams.

Hackathon event 3 (face-to-face, local teams): Creation of themes by children grouping aspects/features provided by all participating groups. Provision of additional themes or features derived from literature for comment and revision. Co-creation of a thematic framework to synthesise review findings and to support development of the survey.

Hackathon event 4 (online, national across-team and face-to-face local in-team discussions): Development of survey: Researchers presented draft questions based on data from children. Children actively selected/rewrote questions/statements to measure children's perceptions of 'quality' in natural environments. Through online interaction, children selected means of rating for the measure.

Hackathon event 5 (face-to-face, local teams): Researchers shared the final survey with the children's advisory group and made any suggested edits to the survey before it was used in the pilot with larger numbers of children.

Advisory group – recruitment and input

The children's advisory group was recruited from a youth group in Cumbria. The aim was to involve these children in co-development of the research project by designing the workshops and contributing to the design of the survey to ensure that our methods were child-focused and accessible. The group was asked to advise on draft activities and to choose or confirm which methods they would prefer. They also advised on wording and how to explain concepts to children. The group comprised 10 children (5 male, 5 female), between 9 and 12 years old. They were all white British, including children with Special Educational Needs or Disabilities and/or with experience of the care system.

The advisory group met with researchers six times during the project, to try out activities and to talk through plans in advance of conducting the workshops.

Recruitment of participants

A total of 93 children between the ages of 8-14 years old were recruited as co-researchers from eight settings across NW and SE England. The settings were 2 secondary schools, 3 state primary schools, a private primary school, a school for deaf children, and a Scout group. Five of these settings were urban inland (64 children; 69%), including city, large town, and suburb of a city; one urban coastal (10 children; 11%); and two rural village settings (19 children; 20%). The settings ranged from the 14th most deprived borough of the UK in the NW to an affluent area in the SE. Participating children comprised 36 girls (39%), 56 boys (60%) and 1 non-binary (1%). Fifteen children were from ethnic minorities (16%); at least 13 children had special educational needs or disabilities (SEND) (14%); and at least two were Looked After Children (LAC) (2%). The demographic figures are based only on the information provided to the researchers, and not all details were complete.

Table 4: Overview of settings and participants

Setting	Urban	Rural	Coast	Inland	Male	Female	Non-binary	Ethnic minority	LAC/SEND
A	x	-	-	x	4	5	0	6	1
B	x	-	-	x	8	7	0	1	0
C	x	-	-	x	5	5	0	2	0
D	-	x	-	-	7	3	0	2	0
E	x	-	-	x	2	3	0	2	5
F	x	-	x	-	5	5	0	0	6
G	-	x	-	-	5	4	0	2	0
H	x	-	-	x	19	5	1	0	3

Ethical considerations

The research project was approved by the ethics committee at UCLan (Ethics application reference: BAHSS2 0272 in November 2021). Participant information sheets and consent forms were devised for children and parents/carers, and all those who took part had been given the opportunity to ask questions before providing signed consent forms from parents/carers. The ethics procedures included children being asked whether they were happy to be involved in online as well as offline workshops, whether or not they were happy to be recorded, and for their artwork and written responses to be photographed. All children's responses to these questions were respected, and children were not required to appear on screen or to speak if they did not wish to. All participants were free to withdraw from the project at any point. We were keen to recruit children from diverse backgrounds and asked schools to resist selecting their most articulate pupils, but rather to provide as wide a range as possible.

Hackathon Event 1

Methods

The first workshop, devised with the help of the children's advisory group, was conducted face to face in each of the eight settings. The aim was to introduce the children to the project and to the challenge we were co-investigating, to position them as co-researchers who are the experts on children's perspectives, and to gain their initial reactions to questions of 'quality' in outdoor spaces.

The first activity related to outdoor natural places they know and might visit. Children were asked to think of outdoor spaces they know – nearby or in this country. In the first instance this was an open question designed to give the researchers an idea of how children conceived the notion of natural outdoor spaces, and to gauge the kinds of places they were familiar with. To prompt ideas, if necessary, researchers provided generic pictures or pictures of places nearby. They were then asked to think about what they liked and disliked about these places, and their answers were recorded.

The second activity in the first workshop asked children to imagine an ideal outdoor place and to create a picture of this place. Researchers supplied them with materials including leaves, twigs, shells, play-doh, photographs and images to cut out (birds, trees, plants, flowers, insects, fungi), glue, cotton wool, pipe-cleaners, paints, coloured pens and pencils.

The third activity asked children to summarise the contents of their pictures and then to choose the most important features. The whole group was then asked to rank the 'top ten' most important features of outdoor spaces that they had identified. Each setting did this slightly differently, facilitated by researchers according to the numbers, ages and preferences of the group. The discussions were rich and wide-

ranging. Researchers took photographs of the pictures and recorded additional notes to support analysis.

Results

When initially asked about 'outdoor natural spaces' they knew, some children began to list places they had been on holiday. When asked to focus on places 'nearby or in this country', responses included: local parks, playgrounds, canals, rivers, woodlands, beach, mountains. Several groups told researchers enthusiastically about school trips to a beach or a National Trust property and it became apparent that some urban-based children were largely reliant on schools for visiting outdoor natural spaces. The provision of pictures of different kinds of landscapes allowed us to widen their perspectives to some extent (in Events 1 and 3), but we recognised that children's very different experiences of the outdoors meant that their imagined spaces were in some cases limited by their own previous exposure. As documented in previous research (e.g. Van Truog, Nakabayashi, & Hosaka 2022), this exposure was determined by family circumstances as well as where they lived. These early discussions revealed that children's experiences varied greatly according to where they lived, parental influences, and issues of access, e.g. whether the family owned a car.

In the second activity, when children were asked to list positive and negative features of the places they knew, their responses included the following:

Positive: That you can play there no matter what age you are, climbing trees, ducks in the ponds, nice flowers, plenty of trees, slides and swings, wildlife, mountains, being active, going in water, quiet, safe, going for a walk, fun to play on bikes, spend time with my family, peace and quiet, wildlife like birds and insects.

Negative: Too much dog poo, not looked after, older young people being intimidating, grass too overgrown, too many takeaway boxes, trees cut down, inappropriate and foul language (graffiti), lakes too dirty to swim in (and too cold), people damaging things, not enough bins for litter, paths too narrow and need to be wider, broken glass around play areas, rubbish and tissues (disgusting), too noisy, too many people.

This was a relatively short exercise, with the majority of the workshop time being spent on the creative activities where children's ideas were developed further.

It is important to note that, although it was not directly referred to in these first workshops, subsequently (in the fourth event) a discussion among a group of young people of minority ethnicities touched on experiences of bullying and harassment in outdoor places due to racism. The emergence of this information indicates the importance of ensuring different groups are represented in understanding views, values and experiences, and the need to facilitate in-depth discussions in spaces

where young people feel able to talk freely about topics that concern them. The data about 'other people' in outdoor spaces led to discussions among the research team and child participants about categorising this and including it in the final survey questions. The children's advisory group suggested that concerns about older children and bullying related to feelings (e.g. feeling safe); and the ethnic minority young people also considered racism to be about feelings of safety and belonging, including a sense of belonging for your own culture. While these relate to how children **feel**, there are also implications for **accessibility** of places: children will not feel able to go to places where they do not feel welcome.

The activity to create an ideal outdoor space was generally very much enjoyed, with some children producing detailed drawings and innovative means of representing items. For example, when three girls decided that it was important to include benches for sitting on and eating lunch, one constructed a bench out of twigs, another drew it on her picture in felt pen, and the third folded a post-it to represent a bench.

In total 87 pictures were created, with some children working as a pair but most choosing to make their own individual pictures. A selection to illustrate the range of styles and media is represented in Figure 3.

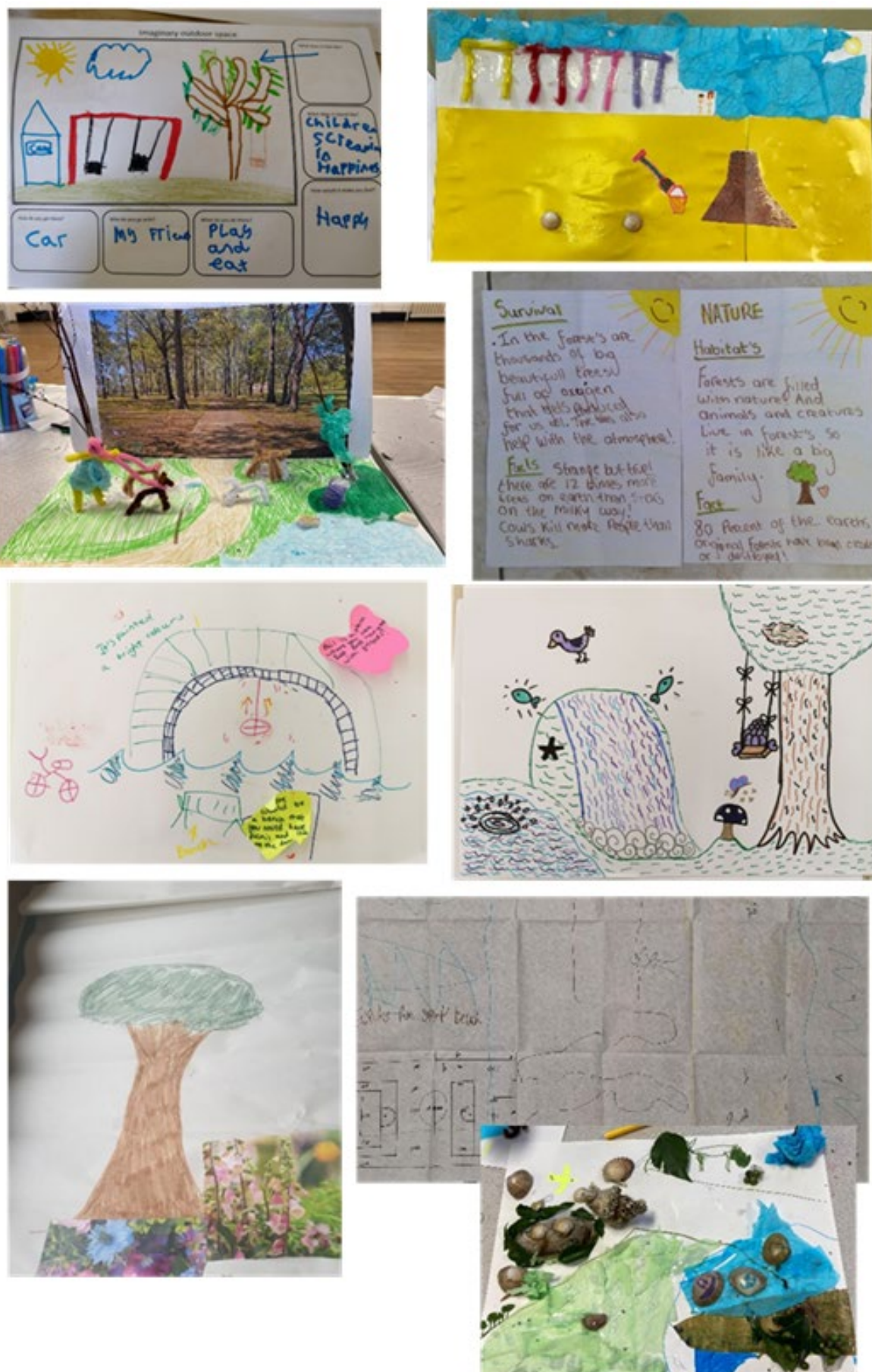


Figure 3: Examples of children's pictures of imaginary ideal outdoor spaces © Candice Satchwell 2022

When the children had completed their pictures, each child in the group was asked to identify the most important aspects of their ideal natural space. Once these had been collected, the group decided together on what they considered collectively to be the most important features or aspects of outdoor natural spaces.

Some examples of the different groups' lists of features are presented below to show comparative similarities and differences (Tables 5, 6, 7). Some groups identified more than ten items but only the top 10 have been included; other groups included repeated items, for example one group listed 'trees for oxygen' four times in their top ten. The full lists are in Appendix 3.

Although there were some notable points made by different groups, overall there was surprisingly little difference between children from urban or rural settings, or between younger and older children. For example, Table 5 shows features identified by secondary school children in a large city in the North West of England (Setting A in Table 4) compared with those in a rural primary school located in the South East (Setting G).

Table 5: Comparing features identified from settings G and A

SE rural primary school (G)	NW urban secondary school (A)
Seeing the creatures	Animals like squirrels, insects, ducks, birds, frogs
Playing with my dogs, having freedom outside	Good weather
Being myself outside	Not to be frightened of being kidnapped
Saving nature from harsh influences	Bins because there aren't enough
Not building houses on nature	Clean rivers
Having fun outside with my family	Friendly environment
Being able to hear birds chirping	Trees
Feeling that you are not doing harm, you are helping	Clean nature
Seeing the flowers	Flowers

The urban children place more emphasis on cleanliness and safety (clean rivers, bins, not being kidnapped); while the rural children have more emphasis on looking after nature (not building houses; not doing harm; saving nature). However, both sets feature trees, flowers, animals, nature, friendliness and sense of belonging. Nonetheless, the observation of the urban children here and in other settings that they did not always feel safe in outdoor spaces was an important point and was taken into account in developing the survey.

Almost all children mentioned being with family and friends, and most featured activities. Table 6 compares a private primary school in an affluent urban location in the South East with a state primary school for deaf children in a large town in the North West.

Table 6: Comparing features identified from settings B and E

SE urban primary school (private) (B)	NW urban special school (state) (E)
Fresh air/oxygen	Space
Having fun with family and friends	Family and friends
Trees protecting us	Trees, Flowers
Swimming with the current	Activities – swimming, sandcastles
Being active	Playground
Running around	Animals – otters, squirrels
Seeing beautiful nature	Clean - no rubbish
Looking at birds	Birds – flamingos, seagulls
Listening to nature	Quiet, not noisy
Hearing the animals	Peaceful, not busy

Even with the significant differences of socioeconomic status and location, and with all children in the special school being deaf or hearing impaired, the features identified almost map onto each other. The deaf children in NW were keen on places which were quiet and not busy; while the children in SE wanted to be able to hear birds and animals – which would not be possible in a place which is noisy or busy. They all wanted to be with family and friends, to be active in a green or blue space, and to see animals, birds and trees. The fact that these two workshops were facilitated by different researchers also indicates that the children were not ‘led’ to these factors.

Table 7 similarly shows similarities; albeit that one group wanted space for dogs to play while the other wanted ‘no dog poo’.

Table 7: Comparing features identified from settings H and D

Scout group in SE (H)	Rural primary school in NW (D)
No dog poo	Litter bins
Fun	Activities – swim in lake, climb trees, skateboard, scooter
Nature/ wildness	Clean, protecting nature
Water/ river	Water - lake, river
Seating	Bugs
Animals	Animals/Wildlife
Quiet zone	Birds
Social area / den	Dogs
Friends/ family	Family
Trees	Trees/Plants

The researchers noted down the ways in which the children ‘labelled’ these features – they were not selected from pre-written cards, for example. This means that some are more descriptive than others, e.g. ‘Flowers smell nice and are pretty and a good attraction’ vs ‘seeing the flowers’. Others also provided more insight into children’s reasoning and understanding, e.g. ‘Living things – because they’re very important when it comes to animals and it helps people calm down and express their feelings’.

Hackathon Event 2

Methods

The second workshop was held online at two different timeslots to give the teams options for attending that might fit with their local timetables. This was an opportunity for children to share their perspectives with one another. The researchers compiled a PowerPoint presentation which included all pictures and lists from the different groups. It enabled the children to comment on things they had not previously thought of and to confirm what they thought was important about outdoor places.

Overall, the second workshop was designed to remind the children about the wider challenge, to start to reflect on the perspectives of other children, and to continue to add their voices. It began with welcoming the different groups and identifying where they were from, followed by reviewing the challenge and the timeline.



Figure 4: Slides from 'Hackathon Event 2' © Candice Satchwell 2022. Star rating visual: © 2019 [Violet Nesdoly](#), used under Creative Commons ([CC BY-NC-ND 2.5 CA](#)).

The children were then asked to consider all the pictures that they were about to be shown, with the following instructions: 'In your group please think and talk about what you have seen from the other groups. Is there anything that strikes you as important to make good outdoor spaces for children? Are there things that children in other groups thought of that you didn't think about? Decide who is going to speak for your group. Prepare two or three things to share.'

Results

Three groups attended the first timeslot for Event 2; and two groups joined the second. The Scouts group could not attend this workshop online due to both timing and lack of technology; and researchers returned to two schools which were unable to attend at the times offered, to do the activities face to face. A recording of the first event was shown to these groups to enhance the sense of being part of a wider project.

While most children who attended were enthusiastic about the experience, feedback from one school indicated that the session could have been more interactive. This was taken into account in designing subsequent online sessions and guidance for participating teams. Other general feedback was that the children very much liked seeing other children and their pictures. A teacher observer commented: "I couldn't believe that the children spoke up – it worked because there was no right or wrong answers."

Feedback from the children about things that they hadn't thought of before, included: mountains (children in SE had not considered these), waterfalls (coastal children had not considered these), roller-skating, flowers, colours, survival, solar panels. Things they saw in others' pictures which confirmed their own ideas were: calmness, rivers, peaceful spots, activities, trees which are fun to play in, friends to play with, play equipment, animals, family, nature, basic needs, rainbows, birds, woodlands, sunshine. One child wanted to make this contribution: "Bugs are the most important things, to keep all wildlife safe." This had been a theme in one of the school discussions but had not appeared prominently in the pictures.

Hackathon Event 3

Methods

Preparation:

Following Event 2, the researchers noted features identified in that workshop, adding them to existing features to create a set of 81 items, using children's own descriptions, which had been agreed or approved by the groups collectively. These items were produced as a set of cards or sheets of paper with the children's wording printed on them, along with blank cards for extra additions.

The cards would be used in the third, face-to-face workshop, when the children would be asked to divide all the features identified into groups and to consider the relative importance of each. In essence, this was a method for the children to conduct analysis of their own data, creating themes (groups of items) from their original codes (all the items they had chosen as important in Workshops 1 and 2). This analysis would lead to: (a) a framework to analyse review findings, and (b) categories for the development of relevant questions/statements for the measure.

Additional preparation for Event 3 was extraction of findings from the rapid review of the literature, representing features identified as significant to children in published research on children's perspectives on outdoor natural spaces. These were printed on sheets to show to the children and to see whether or not they agreed that these points were significant to them. The items in summary of the literature were: Variety in natural spaces; Things to do; Beauty in nature; Place to meet and play; Place you are allowed to be yourself; Calm and peace; Fear in natural spaces; Clean and looked after; Safe and secure; Near to home. The full table is in Appendix 4.

This event was held face-to-face in each of the eight settings, working with the same groups of children as in Workshops 1 and 2. The aims were:

- To consider any additional features that children wanted to include as contributing to quality in outdoor natural environments
- To think more about **why** these features were important
- To compare what all the children in this project had said with what children have said in other projects (via literature review)
- To develop a thematic framework by grouping features identified to analyse the review findings and to support creation of questions/statements for the measure.

Children were given three tasks.

The first activity was intended to give opportunity for widening perspectives by providing further pictures of outdoor environments: a mountainous area, a forest, a coastal scene. To follow up the online workshop (which not all had attended), the children were invited to look at the pictures together and discuss anything they hadn't previously considered when thinking about what they liked or disliked in outdoor natural environments. They were also encouraged to explain **why** they liked or disliked certain things.

To supplement this widening of perspectives, significant items extracted from the literature review on children and young people's perspectives on outdoor places was shared (see Appendix 4). Children's opinions on whether these items were important to them or not were recorded.

The second activity used the set of cards/sheets created by the researchers to represent all the children's contributions. These were spread out on a table, and children were asked to choose one or two cards to add an illustration to. This was designed to include creativity in the session because it had been so popular in the

first workshop and was a way of children conveying their thoughts through drawing as well as words.

In the third activity, they were asked to group the cards (81 in total, plus any additional items added to blank cards) in ways that made sense to them. This was done in different ways in different groups, reflecting children's ages and preferences. For example, in one school the children picked cards from the centre of a table in turn and decided which hoop it should fit into. Another group of children actively ran around a hall with different sheets of paper, distributing them into different groups on different tables. In some settings (e.g. a group of five children with hearing impairments) the number of cards was reduced by removing some duplicated or very similar items. Once the children had grouped the cards in ways that made sense to them, they were asked to provide a label for each category.

Results

The first activity relating to wider perspectives was inspired by looking at the pictures provided by researchers of areas they may not have considered (e.g. mountains, forests) and considering the issues from the literature which the researchers presented in ways appropriate to the group, e.g. by voting on whether they thought each issue was important or not. This led to several discussions about the reasoning behind their perspectives (see Figure 5 for examples of children's reasoning). For example, one group emphasised the importance of habitats for animals even if you don't like them, such as snakes and insects, because they are all part of the same ecosystem and need one another to live. Another conversation provoked by the literature was about the tension between feeling challenged and feeling excited by a place, and by the need to feel safe. The general agreement was that there was a balance required between not being bored, feeling you had achieved something, and that both parents and children needed to feel that children were not in danger. Although 'access' may be regarded as a separate issue to 'quality', important to children was the sense that they had access to natural spaces, that they felt they were allowed to be there, that it was a place for them and that they felt safe there. One child, considering 'fear' in outdoor spaces, wrote: 'I am afraid 5/10 but it also depends on the time of day, how dark, if I am alone or with someone, or if it is crowded'.

MUSHROOMS 

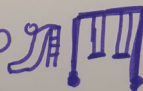
- they are really important to me cause they make things really nice and some of them smell good

TREES 

- they give us oxygen and oxygen is really important or we all would be dead xx

GRASS 

- so that people can stop throwing stuff everywhere
- it's gonna be more cleaner!

PARKS 

- so that we can play or everyone would just be on there phone and just be bored

WATER AND LAKES 

- it would make things look nice and
- ducks will have place to live / to stay.

MORE ANIMALS! 

- frogs there are really nice
- ducks are really cute
- and many more can make things and yea

Trees are really ~~important~~ important for oxygen

Flowers are important for honey

We need the beach so we can spend time with family.

We need fresh water

I am afraid 5/10 but it also depends at the time of day were how dark if I am alone or with someone or if it is crowded

We need benches because we can sit down and take a break

We need toilets because we may need to go.

Figure 5: Examples of children's reasoning © Candice Satchwell 2022

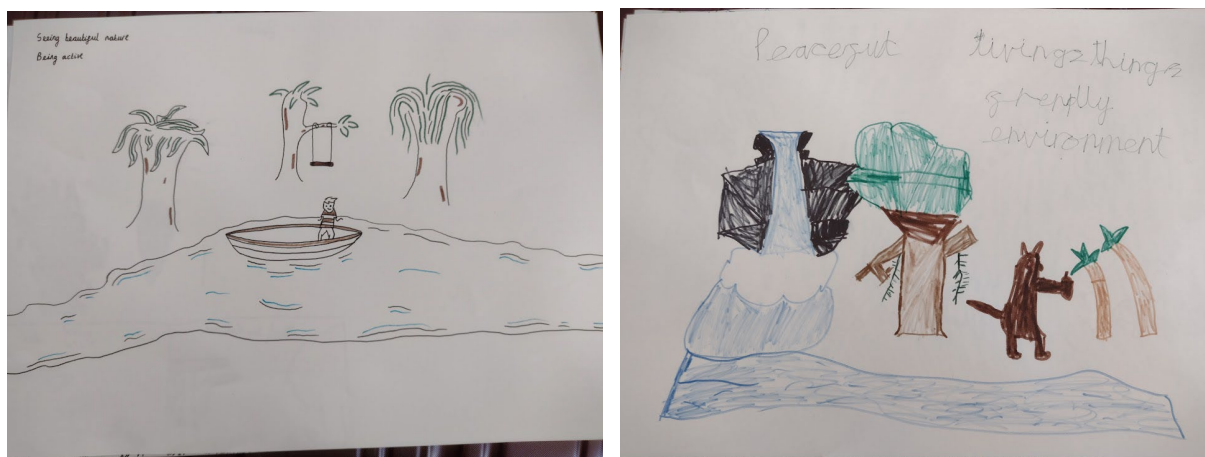


Figure 6: Examples of illustrations for features identified © Candice Satchwell 2022

Activity 2 involved children choosing one or more cards to illustrate. Examples of these are in Figure 6 and demonstrate the attention to detail that some children included. The picture on the left illustrates the child's perception of 'Enjoying beautiful nature', 'Being active'; while the picture on the right is labelled by the child as 'Peaceful', 'living things', 'friendly environment'.

Activity 3 led to children creating themes from all the features they had identified by grouping together all the features in ways that made sense to them. The different settings arrived at groupings as shown in Table 8.

This sorting into categories by the children was followed by the researchers pulling all the responses together into a thematic framework. In this way, we arrived at categories of features which could be used to represent the themes which seemed to encompass all children's ideas. These themes would then be taken back to the children for their comments. The thematic framework is presented in the next section.

Table 8: Themes created by each setting

Setting	Themes
School A	Motor vehicles Bugs and animals Animals' Habitats Protecting Nature Sounds Aspects of nature Fun
School B	Space Solar power Hanging out High in the sky Animals Nature Anti-plastic pollution Outdoor activities

Setting	Themes
	Chill
School C	Outdoor Fun Wavy Waters Quiet Peaceful Corner Amazing Animals Wonder Weather Forever Family Our Clean Environment
School D	Plants and Trees Helping the Environment Water – rivers, lakes, sea Animals Pets and Animals Places to eat, or to do things - transportation Sports – things to do Open Spaces Trash Family and friends People and their feelings Weather
School E	Animals Rubbish Good weather Trees and flowers Nature and protecting Nature Family Activities
School F	Animals Activities Nature Society (the people around us and the impact it might have on nature) Environment (the environment around us)
School G	Wildlife Space Water Looking after nature Being active Being myself outside
Scouts (Group Ha)	Be by yourself Together Helping Pollution Emotions Being yourself Open space Eating Variety

Setting	Themes
	Entertainment Living things
Scouts (Group Hb)	Dogs Activity Quiet Transport Feelings Friends and family Variety Wild/nature
Scouts (Group Hc)	Facilities Feelings Activities Weather Vehicles Scenery + Air + Trees + Plants Animals

4. Development of the quantitative measure

Aims

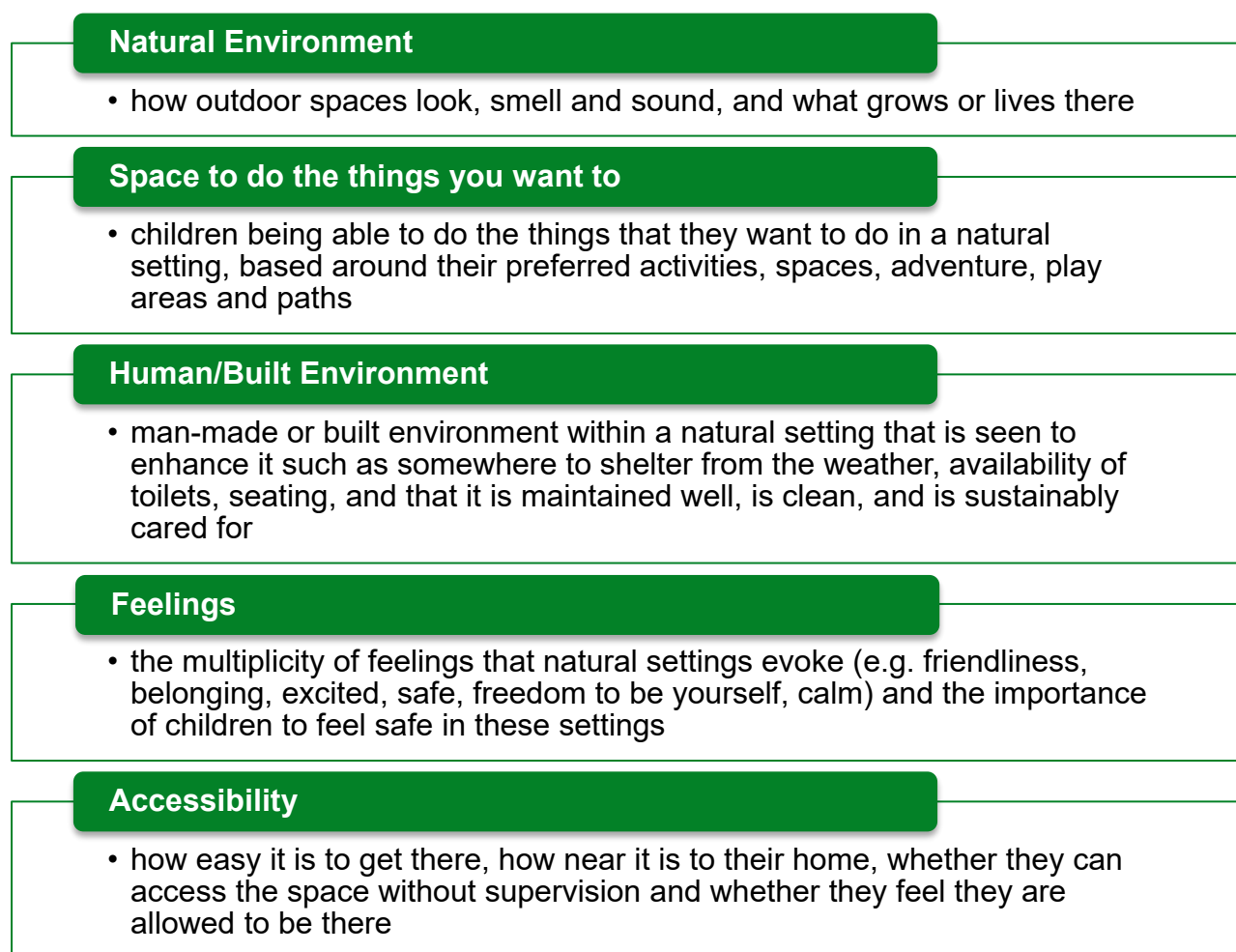
The next steps were to use insights from the qualitative research with children and young people to identify relevant and appropriate questions that can be posed to children and young people about the quality of their local natural outdoor spaces.

Methods

Creation of themes

The final themes incorporated the children's reasoning and, although reductive in relation to the breadth and depth of input from children, were seen to be broadly representative of the way children saw elements which contributed to 'quality' in natural environments. The themes also brought an awareness of the ways in which previous research had categorised elements contributing to quality in outdoor environments. The researchers were keen to retain the perspectives and priorities of the children in this project as far as possible. The themes arrived at are shown in Figure 1.

Based on analysis of the children's input, we devised a set of draft questions/statements for children to comment on. The themes and some draft questions under each theme were posed to children in the next workshop, for discussion. A session plan, including an introductory question to the survey (to put questions in context) and draft questions, was provided to the schools and is included in Appendix 4.



Copy of Figure 1: Co-created thematic framework

Hackathon Event 4

The fourth event was an opportunity to develop and refine the themes and select some potential survey questions. It also aimed to give children the space to decide on a preferred scale for rating quality in the survey. The proposed activities were decided with input from the children's advisory group.

As with Event 2, this event was designed as a hybrid workshop, whereby researchers invited multiple groups to attend an online session, introduced the activities and then gave the groups time to work with a teacher in their own settings before coming back together online to share their thoughts. Again, as with Event 2, we offered two different days/times to allow as many groups as possible to join, and also offered to visit schools to accompany the workshop in person if requested.

The first activity involved trying out a range of rating scales through a short survey which could be interacted with in three ways: online through individual devices, verbally through the video conference space and locally on paper (see Appendix 5). The survey asked for ratings of 'how good is chocolate' and 'how much do you like brussels sprouts'. Children tried out the different scales and how they looked, and then voted on their favourite.

The second activity asked children to work locally in their teams, sometimes with a co-located adult, and with a researcher always present online to respond to questions. They looked at the draft survey to tell us what they thought of the questions and to consider suitable rating scales. To ensure they understood that we wanted them to criticise the wording and come up with their own questions, rather than simply answering the questions, we reiterated their role as experts in the kind of language that other children in the country would understand.

The instructions they were given, both written and verbally by the researcher facilitator, were to choose one of the 5 themes, and to decide on questions to use about these themes in the survey. The full instructions are in Appendix 6.

Results

The first workshop was attended by three school groups: one secondary school and two primary schools. Another secondary school could only attend at a specific time, so the researchers put on an additional online session for that school. All schools that attended the online workshops had teachers facilitating the groups.

Despite being offered two different times, some schools still could not join because of timetabling issues and staff shortages (due to COVID-19). Two of these schools were visited by researchers to do the activities face-to-face.

Feedback on rating scales

When children had seen and tried out various methods of rating choices, overall their preferred options were star ratings or a sliding scale that they could move along with a cursor online, or mark with a pencil on paper. Some children liked smiley-sad faces; less popular were thermometers, dials or traffic lights. Sliding scales in particular seemed to be favoured for being 'like on Instagram' and because they felt more interactive than choosing a number/statement.

Feedback on the 'introductory question'

The description of places 'no more than 45 minutes away' was considered to be unclear as to whether that meant on foot or by motor vehicle. The 45 minutes had been suggested by children in the advisory group to include all the places they might visit, but this wider group of children helped the researchers and Natural England advisors to agree on the following final wording:

Which of these natural outdoor spaces are close to your home (no more than 20 minutes' walk away).

Select all places you go to by yourself or with someone else, by walking or with a mobility aid. Please choose one or more options.

Note that this introductory question was designed for piloting the questions in stage 5 of this research, but the intention would be that the introduction could be changed to suit the purposes of different pieces of research. Some research may want children to focus broadly on outdoor spaces near them as with this example, but other research may be interested in perceived quality of a particular local space or type of space.

Regarding the categories of 'outdoor spaces' that could be selected some children suggested that 'grass' and 'playing field' were similar; and that different kinds of water should be included, e.g. canal, lake, river. Following this feedback, the items included in the final version were aligned with those in the C-PANS, but with the removal of 'Garden – mine or someone else's' and 'Indoors (at home, someone else's house or other places inside)'.

The final list was as follows:

- ☐ Park / playing field / playground
- ☐ Grassy areas in the streets near me (e.g. a green, roadside or pathway)
- ☐ Grassy areas you pay to go to (e.g. gardens of a big house, the zoo, or city farm)
- ☐ Beach or seaside
- ☐ Woods / forest
- ☐ Fields / farmland / countryside
- ☐ Rivers / lakes / canals
- ☐ Hills/ mountains/ moorland
- ☐ Another space (not in this list)

Feedback on Questions

During the online session children critiqued some of the questions but few created new questions. This was not surprising as the questions/statements had been created from the children's input.

Various issues were discussed to do with phrasing and lexis. For example, words they thought were problematic included 'sustainably' in 'sustainably cared for'; 'comforts' in 'How well do the outdoor spaces near you provide the comforts you need?' and 'secret' in 'Are there enough secret or wild areas?' They felt that these ideas needed more clarification. Most children knew the word 'habitats' but some felt 'homes' would be better. Whether the phrasing should be as statements or questions was discussed: given that we were using stars or sliding scales it was felt that statements would better reflect the concept of 'how much' or 'to what extent'. Therefore, the question 'How much are there different places (habitats) for animals to live?' should be worded instead as a statement: 'There are lots of places for animals and birds to make their homes'.

In the second online workshop attended by a group of secondary school children with a large proportion of minority ethnicities, a discussion about 'feelings' included some important observations. The most important feelings for this group (and these

reflected the thoughts of other children) were feeling happy, safe and calm. They wanted to feel that they belonged – ‘belonging for your culture is important’, and that they would be safe in an outdoor space. The discussion explicitly included examples of racism and children feeling unsafe because people could be ‘rude to us’. This led to a discussion about ‘other people’ that might be in the outdoor places, and the children suggested a survey question: ‘Do the people there let you do what you want?’ The importance of safety and belonging was paramount. Subsequent discussions with children queried the notion of ‘belonging’ as perhaps something difficult for younger children to understand. Safety, on the other hand, was something that children of all ages responded to.

The deaf children could not attend the online session, but a researcher went to their school to gather their thoughts on the draft themes and survey questions. The children and their interpreter pointed out some difficult words to understand/interpret, including ‘habitat’ and ‘human or built environment’. The children said that the question ‘How interesting are sounds and smells?’ should be changed because they could smell but not hear. All the children crossed out the word ‘sounds’ from this question on the paper copy they were given. They also discussed what might be important for other people with disabilities such as being blind or confined to a wheelchair.

All of these points were taken into account when refining the final statements, which were then taken to the children’s advisory group for final approval.

Section 5 describes the piloting and validation of the measure.

5. Piloting of the measure

Aims

This final stage tested the co-created questions with a larger sample of children in the form of an online survey. The aim of piloting this long version of the co-created measure was to examine reliability and validity of the questions to inform the selection of items to use in a final measure.

Method

The team created a survey online through Qualtrics software, containing 40 questions covering the five co-produced themes (see Appendix 6). Face validity had been tested in previous stages, but we still needed to test for construct and predictive validity as explained below.

Given that natural environment quality has been linked with nature connectedness and well-being (Berto et al., 2018; Tang et al., 2015), we included both a measure of connectedness to nature and a measure of well-being within the survey. This allowed us to examine the predictive validity (i.e. whether the measure is associated with scores on other measures as would be expected) of the co-created measure of perceived quality of the natural environment. Children were asked to complete the validated Nature Connection Index (NCI; Richardson et al., 2019) and the Personal Well-being Index – School Children (PWI-SC, Cummins & Lau, 2005) alongside the 40 questions. The Personal Well-being Index also has a single item measure about children's happiness with their life as a whole; we used both the full measure and the single item measure in the survey. Associations between the co-created measure and well-being and children's connectedness to nature were examined using Pearson's correlations.

Construct validity was examined using factor analysis, which is used to reduce a large number of variables into a smaller number of factors. This was used to enable a decision about which of the questions in the co-created measure examined quality best and/or fitted within the themes co-produced with children.

We were not able to test for concurrent validity (e.g. whether scores on the co-created measure are similar to scores on another similar validated measure) because our systematic review did not reveal any existing measures of perceived quality of the natural environment for children.

We also looked at missing data to examine whether there were any patterns in non-completion of questions that may indicate that a question was not easy to understand or presented children with difficulties in answering.

We aimed to pilot the measure with approximately 100 children, although this number was increased as a larger sample size was needed because of the volume

of missing data. Researchers provided schools and groups with the link to the survey online and also circulated a paper version so that teachers could choose the most appropriate format to use in their schools. Children completed the survey either during school classes with their schoolteachers or in their own time outside of school; for example, one secondary school provided the link to the survey in their newsletter.

Results

The survey was completed by 177 children recruited from 8 settings in the NW and SE of England. Four children who were aged seven and one aged 17 were excluded from the dataset because the co-created measure was designed for children aged 8-15 years, leaving 172 children for the analysis. One hundred and ten (62.00%) children completed the survey online, the rest completed a paper-based version. Only 167 children provided their age. Ages ranged from 8-14 years, with a mean age of 10.59 (SD = 1.35). Ninety-one children provided information about their gender, ethnicity, disability and location. Characteristics of children completing the survey are displayed in Table 9.

Table 9: Characteristics of respondents in the survey pilot

Characteristic	n	%
Gender		
Female	89	51.7
Male	78	45.4
Non-binary	3	1.7
Other	1	0.6
No response	1	0.6
Ethnicity (free text)		
British/English	51	30.2
White British	27	15.7
British Pakistani	16	9.3
Asian	6	3.5
Asian British	4	2.3
Mixed	4	2.3
White	3	1.7
Pakistani	3	1.7
Welsh	2	1.2
British Indian	2	1.2
Polish	2	1.2
Australian English	1	0.6
50% Australian and 50% English	1	0.6
American/British	1	0.6
Arab	1	0.6
Arab African	1	0.6
Bengali British	1	0.6
Black Indian	1	0.6
Brown Asian	1	0.6

Characteristic	n	%
Czech	1	0.6
English/Italian	1	0.6
German	1	0.6
Half Scottish, half English	1	0.6
Romanian	1	0.6
Salvadorian	1	0.6
Spanish	1	0.6
Syrian	1	0.6
Irish/Greek	1	0.6
Irish/British	1	0.6
Italian/British	1	0.6
Jamaican, Scottish,	1	0.6
Malagasy	1	0.6
Mixed white British and British Indian	1	0.6
Scottish 7.5%, Welsh 6%, English 76.5%	1	0.6
White British, quarter Irish	1	0.6
White Greek-Cypriot	1	0.6
White Polish	1	0.6
Unreadable	1	0.6
Don't understand	1	0.6
No response	24	14.0
Disability		
Yes	2	1.2
No	142	82.6
Don't know	13	7.6
Prefer not to answer	10	5.8
No response	1	0.6
Location		
A city or large town	88	51.2
A small town	41	23.8
A village or countryside	40	23.3
No response	3	1.7

Reliability of measures

We used Cronbach's alpha to examine the reliability of the measures. Table 10 displays the reliability coefficients for each of the measures in the survey. Scores above .70 are considered acceptable, .80 good and .90 excellent. The co-created measure had excellent reliability.

Table 10: Reliability of measures

Measure	Reliability score
Perceived Nature Quality – Co-created measure (40 items)	.94
Nature Connectedness Index (NCI)	.90
Personal Well-being Index – School Children (PWI-SC)	.85

Predictive validity

Using Pearson’s correlation coefficient to look at the association between our co-created measure of quality with the other two measures, we found that it was associated with children’s well-being (full measure - $r = .63$, $p < .001$, single item measure – $r = .66$, $p < .001$) and weakly associated with children’s connection to nature ($r = .28$, $p = .048$).

Missing data analysis

We conducted a missing data analysis to examine whether there were any patterns in relation to the questions children choose not to answer. Although the missing data analysis revealed that the data were missing completely at random, there were a number of questions where there were missing data that amounted to over 15% of the total data set, which may indicate a pattern of deliberation in refusal to answer some of the questions. Table 11 details the questions in the measure that were regularly not answered by children and the percentage of missing data for each one.

Table 11: Survey items with missing data above 15%

Survey item	% of missing data
There are no areas I like to play in. (Space Q4)	17.4
There are no good spaces for children to be. (Feelings Q4)	23.8
I can go there by myself. (Access Q2)	20.9
I can only get there if an adult takes me in a vehicle or on public transport. (Access Q3)	19.2
It feels like I’m not allowed to be there because I’m a child. (Access Q5)	23.8
I feel like other people don’t want me to be there. (Access Q6)	22.7

Examining construct validity

A factor analysis was used to identify groupings of questions that might relate to common themes. The factor analysis identified 8 factors (i.e. themes). The factors identified with their factor loadings are displayed in Table 12. Factor loadings relate

to how well the item fits with the factor identified by the analysis, with higher numbers indicating higher levels of how much the item relates to the factor. Factors identified are discussed in relation to the co-created themes and qualitative work below.

The majority of the 40 items fitted into Factor 1. Containing mostly items from the co-created themes of Natural Environment and Space, this factor could be described as relating to the *functionality* of the natural environment. Factor 2 could be about *safety*, including the maintenance of the space as well as safety in relation to other people, and mapping mostly with the co-created theme of Human and Built Environment. This reflects how children discussed safety in the qualitative work, as they considered both physical injury and threat from other people. Factor 3 seems to relate to *travel* to the natural environment. Unlike the co-created themes developed in the qualitative work, there was not a factor relating to feelings. Instead, these items were included in other factors, and may indicate that although feelings are important, they are likely to be dependent on or highly connected to perceived functions of natural spaces and a sense of how safe the space is for children. Factors 4-8 had only one or two items in them and may reflect that some of the items are unrelated to the other identified factors; for example, how accessible it is for children with disabilities, whether it is appropriate for all ages, or has shelter from the weather.

Table 12. Results of the factor analysis with factor loadings

Factor	Survey items relating to the factor*	Factor loadings
Factor 1: Functionality	I can be active there if I want to.	.81
	I can spend time with my family there.	.80
	I can do the things I enjoy doing outdoors when I am there.	.80
	I can be with my friends there.	.77
	There are lots of different kinds of trees and plants.	.77
	I can hear sounds of nature (like birds singing or buzzing bees).	.76
	I can have adventures there.	.74
	There are good spaces for playing.	.73
	There are lots of places for animals and birds to make their homes.	.73
	There are lots of insects and other animals.	.71
	There are lots of different colours.	.70
	There are enough benches or things to sit on.	.69
	There is somewhere to get nice food and drink.	.60
Factor 2: Safety	I worry that other people there might not be nice.	.80
	There is lots of dog mess.	.77
	I feel like other people don't want me to be there.	.69
	It is clean and well looked after.	.68
	There is lots of litter.	.65
	I feel safe when I am there.	.61
		.60

Factor	Survey items relating to the factor*	Factor loadings
	I feel like I can be myself when I am there. It feels friendly and welcoming.	.60
Factor 3: Travel	I can only get there if an adult takes me in a vehicle or on public transport. It is easy to get there by walking.	.83 .79
Factor 4	There are places to shelter from the weather. There are interesting and nice smells.	.71 .69
Factor 5	There are things to do for children of all ages.	.72
Factor 6	There are beautiful things to see.	.75
Factor 7	I feel like I am not harming nature there.	.75
Factor 8	It is difficult for children to be there if they are disabled.	.89

*Note: only factor loadings of .60 and above have been included.

Finalising the questions for inclusion in the measure

We used the following rationale in deciding which questions to retain in the final version of the survey:

- Omitting the questions that had a high percentage (15%) of missing data, indicating patterns of refusal to complete the question.
- Using the findings of the factor analysis to identify questions that have strong construct validity, including items from each factor identified.
- Aiming to have at least two items for each thematic category identified by children.
- Reviewing the questions to ensure that salient themes from qualitative and co-production work are retained.

This resulted in a measure including 12 items. The reliability of the resulting measure was examined and was shown to have excellent reliability (Cronbach's alpha = .91). It also has good predictive validity and is associated with children's connectedness to nature ($r = .40$, $p < .001$) and well-being (full scale – $r = .68$, $p < .001$; single item – $r = .57$, $p < .001$). The included items are displayed below:

- There are lots of different colours
- There are lots of places for animals and birds to make their homes
- There are good spaces for playing
- I can be active there if I want to
- It is clean and well looked after
- There is lots of fresh air
- There are places to shelter from the weather
- I can do the things I enjoy doing outdoors when I am there
- I feel like I belong there
- I feel safe when I am there
- I feel like I can be myself when I am there
- It is easy to get there by walking

When taken to a group of 25 children who had already filled in the full survey, there was broad consensus that these items were easily understood and asked important questions. However, a couple of children queried the meaning of 'belong', and one questioned the concept of 'lots of fresh air' because "there has to be air there". The research team intends to carry out final consultation meetings with three groups of children across the age range to assess and refine the final wording for a 12-item survey.

In the meantime, after consultation with the research team and with children accessed by Kantar to conduct cognitive interviews, five items were agreed for the C-PANS survey. The resulting questions are:

Thinking about the natural outdoor spaces near you. How much do you agree or disagree that...

[sliding scale from "*0 disagree a lot*" to "*10 agree a lot*". No text on points 1 to 9 and additional "*prefer not to say*" and "*don't know*" options]

There are lots of places for animals and birds to make their homes

There are good spaces for playing

They are clean and well looked after

I feel welcome there

They are easy to get to by walking

6. Summary and conclusions

The aim of this research was to gain a better understanding of children's perspectives on what 'quality' means in their local natural environments. These insights were then used to co-create with children a measure suitable for children and young people aged 8-15, allowing them to rate the quality of natural outdoor spaces. The resulting measure could be used to rate a specific outdoor space, e.g. a nature reserve or a local park; or it could be used to rate local outdoor spaces more generally. The latter of these is assumed to be the main way in which the survey will be used by Natural England within C-PANS.

A systematic review of literature was complemented by qualitative research with 93 children and young people, overseen by a children's advisory group. The methodology adopted was a child-focused hackathon, which enabled children to contribute their voices and perspectives throughout, and to take ownership of the problem that they were posed: **'No-one really knows what children think about the outdoor spaces they visit.'** The approach involved a combination of face-to-face workshops with around 10 children and young people in each location and online workshops which brought several groups together to share and learn about others' views. The face-to-face workshops enabled researchers to gain in-depth insights into children's perspectives by working directly with small groups and engaging in art-making and other activities, as well as discussion. The online events were opportunities for participants to share their thoughts, hear others', respond to queries and dilemmas from the adult researchers, and arrive at consensus. There were limitations, however, in that access to IT equipment varied significantly: for example, one private school could provide computers for each child while a scout group was unable to access the internet; other school groups sat around a desk with one laptop operated by a teacher; and some schools were unable to attend the joint online workshops for other reasons, despite being offered different timeslots. Therefore, the combination of both online and offline events was effective, as researchers could visit those groups in person to keep them updated and involved in the research.

The factors that children identified as contributing to the 'quality' of an outdoor space included: variety in animals and plants; facilities; activities and play spaces; feelings and senses; access; safety and well-being. This is the first project to incorporate the details and nuances of children's perspectives into the development of a measure that is appropriate and meaningful for children. The combination of qualitative workshops and co-production work leading to the development of a quantitative measure adds a degree of robustness and legitimacy to the measure.

The diversity of backgrounds, locations and characteristics of children and young people involved in the study ensured that different perspectives were included in the overall design of the measure. Children from all groups identified many similar features as important to them, as shown by the resulting themes: Natural

Environment; Space to do the things you want to; Human/Built Environment; Feelings; and Accessibility. Although the study prioritised inclusion over comparison between groups, there were some differences noted between children from urban and rural areas: for example, urban children were more likely to be wary of natural spaces and to be concerned about other people in those spaces. Children in all settings were equally concerned about safety in natural spaces, although for some this was combined with a desire for challenge as well. All children wanted a variety of animals and plants/trees, with trees being particularly important. Children also placed an emphasis on the need for spaces to provide calm and peaceful environments. This might seem at odds with children also wanting fun and excitement; but there was a clear expression for the need to feel calm from children and young people of all ages.

Regarding activities and play areas, again these were prominent for all children. They were not necessarily in favour of designated playgrounds, but rather areas where they could play in ways they wanted. The desire to play (whether imaginary games with wooden sticks, making a den or a game of football) was prominent in both younger and older participants. Activities such as climbing trees and swimming in rivers were mentioned frequently, whereas playing on a swing or slide was less frequently mentioned. This did depend, however, on children's locations, with those from urban environments and less experience of visiting nature initially mentioning playgrounds as areas they visit. Nonetheless, when asked to envisage imaginary ideal outdoor spaces, the focus was invariably on the natural rather than built environment.

The influence of knowledge and education about the environment was clear in some settings. References to trees, for example, were linked by children to the need for oxygen and to decrease carbon dioxide in the atmosphere. Some children, who had learned about the role of insects in ecosystems, wanted to include them, while others did not. Children had widely different experiences in the number, frequency and types of outdoor spaces they visited, depending not only on their location but the ease with which they could access them (parental attitudes; available transport). Some children relied almost exclusively on their school for trips to a beach or a nature reserve, or even for access to a playground. These findings indicate the role of both education about the natural world and the experience of the outdoors in influencing children's perspectives. Without experiencing a range of outdoor environments, it is difficult for children to consider how to judge the quality of those available to them. The role of schools in giving children these experiences, and providing education about natural environments, is crucial, not only in allowing children to know what they like or dislike, but also in shaping their values and attitudes towards nature.

The inclusion of the measures of (a) health and well-being, and (b) connectedness to nature in the survey supports our findings that, similar to adults (Berto et al., 2018; Tang et al., 2015), these are associated with perceived quality of the natural

environment. In short, the pilot survey indicated that children who perceived their local natural spaces to be of low quality reported poorer health and well-being and poorer connection to nature. Our findings highlight the importance not only of exposure to nature but children's subjective experience of natural spaces, indicating that children's perceptions of the quality of the natural environment may impact on their health and wellbeing as well as their affinity for natural spaces. This has important implications for long-term well-being of children who have limited access to quality outdoor spaces. Perceived quality of local outdoor natural spaces corresponds with other indices of deprivation and therefore it is likely that lack of access to quality outdoor space compounds wellbeing inequalities.

Given that children raised issues around a sense of belonging, access to and safety in natural spaces, it is important to ensure that children not only have quality green and blue spaces near them but that their access to those spaces is enabled and valued by adults. Involving children and young people in the design and maintenance of such spaces, both now and in the future as our environment changes, will ensure that children's preferences are reflected, while positioning children as valued users and keepers of natural environments.

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Appendices

Appendix 1

Summary of studies included in systematic literature review

First author	Year	Country	Study aim	Description of sample	Data collection
Aaron	2011	USA	how urban minority children perceive and define nature	fifth-grade students from five different schools within the Houston Independent School District (HISD). equally split by gender, 56 percent were Hispanic, 38 percent African American, and 6 percent Caucasian/Bi-racial	interview with drawing activity
Adams	2015	South Africa	ways in which adolescents perceive the natural environment	equally split by gender, aged 13 to 14 years in grade nine attending a secondary school in a low SES community on the Cape Flats, South Africa.	focus group interview
Adams	2019	South Africa	perceptions and meanings that children from a low socio-economic status (SES) community attach to Child Friendly cities (CFC)	equally split by gender, aged 13 to 14 years in grade nine attending a secondary school in a low SES community on the Cape Flats, South Africa.	focus group interview
Bell	2003	Scotland	explore in depth the contested views of freedom and control in urban fringe woodland expressed by site managers, adults, children, and teenagers	school children chosen by teachers at the local, public authority secondary school for each community, equally split	focus group, observation of park visits

First author	Year	Country	Study aim	Description of sample	Data collection
				by gender, at least two from each year group, 12-18 years,	
Blanton	2013	USA	perceptions and opinions of a nature-based physical activity intervention designed for low-income urban adolescents	7 females, 13 males, 11-14 years, eleven of the 20 participants qualified for free or reduced lunch at their schools based on their parents' income levels. Seventeen participants were African American, 2 were biracial, and 1 was Caucasian. 'inner-city youth'	focus groups
Bonnett	1998	UK	children's perceptions of and attitudes towards nature and the environment	Year 5/6 pupils in four East Anglian primary schools in rural and urban locations.	group interviews with drawing activity and photographs
Donnell	2015	Canada and Slovakia	compare Canadian and Slovakian children's relationships with nature in terms of how children define nature, their feelings towards it and experiences	5-8 years of age from Canada (n=26) and Slovakia (n=26). Canadian sample - 8 boys and 18 girls and Slovakian sample was equally split by gender	interviews with drawing activity and photographs
Douglas	2016	USA	examine access to parks in and around the children's school neighbourhood.	ethnoculturally diverse students, 15-17 years of age	collaborative student-led research project
Francis	2013	Australia	examine accessibility to nature and the types of interactions with the natural world experienced	Year 6 and 7 student participants from one classroom within School of Education Aspirations project	drawing activity and questionnaire, focus groups
Gidlow	2011	UK	evaluation of a 12-month project to promote use of a small neighbourhood park in a deprived urban community	12-15 years, adolescents who lived close to (based on postcode), and	focus groups

First author	Year	Country	Study aim	Description of sample	Data collection
				frequented or were familiar with the park, were recruited.	
Jancairkova	2021	Czech Republic	discover, classify, and compare the ideas about nature of Czech preschool children.	children from 21 Czech ordinary kindergartens, average age = 5.1 years, roughly evenly split by gender	interview
Jansson	2021	Sweden and Denmark	examine the specific role of green space management in developing child- friendly environments, focusing on children's perspectives	aged 10– 11; two case areas in southern Sweden and two in eastern Denmark, with one urban village, representing smaller built- up areas with an urban lifestyle, and one city district, representing part of a larger and denser city, in each country	case study - walking interviews
Mahidu	2010	Malaysia	investigate children's preferences for natural environment	11-17 year (6 male, 11 female), children of the staff of Faculty of Design and Architecture	photo-projection followed by an interview
McAllister	2012	Canada	understand children's current interactions with greenspaces	10-12 years, in addition, 13 students (all female) from a grade 6 class, who were all members of an environmental club	policy documentary analysis, interview with drawing activity and photographs
Payne	2014	Australia	examined children's conceptions of nature and their constructed meaning of the people-environment or culture- nature interfaces	9 girls and 5 boys taking part in a series of philosophy for children's sessions	philosophical inquiry

First author	Year	Country	Study aim	Description of sample	Data collection
Raith	2017	Germany	how children are using green schoolyards and whether nature experiences occur there	students with exceptionally strong connection to nature were excluded. 20 girls and 18 boys	interviews
Simmons	1994	USA	what attributes define preferred settings for children and to what extent do children associate particular activities with these attributes	Third and fourth grade (eight- to nine-year-old) students from four cities in the urban Chicago metropolitan area.	interviews with photographs
Tapsell	1997	UK	children's perceptions of river corridor environments	29 girls and 20 boys, around 8 years old.	interviews with maps, photographs and drawing activity
von Benzon	2017	UK	relationship between the way in which disabled young people are conceptualised, and the way in which the green spaces they access are perceived, considering how the constructions of 'unruliness' and 'boundlessness' lead to a specific set of interactions	Children aged 11-16 from special educational needs secondary school	fieldwork, interviews, and observations
von Benzon	2018	UK	the conflict between academic and societal approaches to the nature/culture divide through the perceptions and experiences of learning-disabled young people	Children aged 11-16 from special educational needs secondary school	ethnography and creative qualitative research
Wals	1994	USA	the way young adolescents perceive and experience nature and the way their perceptions and experiences could relate to schooling in general and environmental education	Middle school children taking part in a supported environmental education project from two city and two suburban schools	participant observation, interviews

Appendix 2

Studies included in the systematic review

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von Benzon, N., 2018. Discussing Nature, 'Doing' Nature: For an emancipatory approach to conceptualizing young people's access to outdoor green space. *Geoforum*, 93, pp.79-86.

von Benzon, N., 2017. Unruly children in unbounded spaces: School-based nature experiences for urban learning disabled young people in Greater Manchester, UK. *Journal of Rural Studies*, 51, pp.240-250.

Wals, A.E., 1994. Nobody planted it, it just grew! Young adolescents' perceptions and experiences of nature in the context of urban environmental education. *Children's Environments*, pp.177-193.

Appendix 3

‘Top 10’ (or more) features of outdoor spaces identified by children

School	Features
School A	Clean rivers Animals like squirrels, insects, ducks, birds, frogs Trees Bins because there aren't enough Good weather Flowers Not to be frightened of being kidnapped Friendly environment Clean nature Lots of sea and sand to play with Cherry trees as these are pretty and smell nice and are peaceful Somewhere there is no litter, rubbish or mould Flowers smell nice and are pretty and a good attraction Clean and friendly environment Animals Cars and mountains Snow
School B	Fresh air/oxygen Having fun with family and friends Trees protecting us Swimming with the current Being active Running around Seeing beautiful nature Looking at birds Listening to nature Hearing the animals
School C	Living things/ life Trees for oxygen I think the most important in nature is the sun because without the sun the trees and plants don't grow. Without oxygen we can't live. Living things – because they're very important when it comes to animals and it helps people calm down and express their feelings Wildlife Trees – they supply oxygen Trees – because they are full of oxygen Trees- because the more trees, the more oxygen. We will also live for a longer period of time.
School D	Family Animals/Wildlife Birds Trees/Plants Water - lake, river

School	Features
	Bugs Litter bins Dogs Clean, protecting nature Activities – swim in lake, climb trees, skateboard, scooter
School E	Family and friends Peaceful, not busy Quiet, not noisy Space Trees, Flowers Animals – otters, squirrels Birds – flamingos, seagulls Activities – swimming, sandcastles Playground Clean - no rubbish
School F	Family Water Sports areas Quiet Space Places to eat Areas to chill Name of the place
School G	Playing with my dogs, having freedom outside Not building houses on nature Being myself outside Saving nature from harsh influences Seeing the creatures Having fun outside with my family Being able to hear birds chirping Feeling that you are not doing harm, you are helping Seeing the flowers
Group H	No dog poo Fun Nature/ wildness Water/ river Seating Animals Quiet zone Social area / den Friends/ family Trees Fresh air No hunters Places to eat and sit Peace and calm and naturalness Outdoor grass space Plants Cover from rain/ shelter Basketball

Appendix 4

Findings from an initial rapid review of the literature shared with children in workshop 3

Theme	Examples from literature
Importance of natural elements	Nature as pure and clean Sun shining on me Wild Lots of natural elements (trees, plants, animals, flowers, sun, sky, grass, water)
Variety in natural spaces	Different levels Places with different levels/shady areas/big grassy areas - "millions of bits" Places to sit Place to walk my dog Different people will like different things about nature
Nature is beautiful	Colour Nice smells Variety
Things to do	Physical challenge Explore Construct Climb Hide Observe Make a den Open spaces – to run and play Fishing Boating Not boring
Place I can be in	Feeling that it is a space that is mine Part of me Allowed to be there
Place to meet and play	Meet friends
Nature calms me	Peaceful Get away from things that are upsetting me (e.g. arguments with parents/siblings) – it's an escape Go to think and reflect Be alone
Positive feelings	Fun, free Essential for my well-being
Negative feelings	Fear: particularly the woods/forests (told not to go in there, dangerous animals, branches may fall on me and hurt me,

	going in the woods alone, fear of slipping and falling)
Needs to be looked after	It's a threatened place Pollution
Should be clean and tidy	No litter/rubbish No broken things (play structures) tidiness Trees cleaning the air
Needs to be near where I live and safe to get to (traffic, roads to cross)	Be able to get there on my own (without parents)
Needs to feel safe	Undesirable people (may take me – kidnap, older children – anti-social behaviour – drinking, taking drugs) Not being watched
Needs to feel secure	Shelter (from the weather) Places to hide Create a nest

Appendix 5

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‘Food survey’ for testing rating scales

Q1. Try out this way of telling us about the theme of food - move the slider along to give marks out of 10.

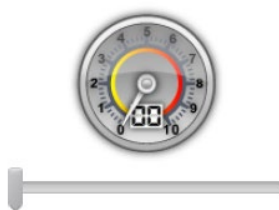
	0	1	2	3	4	5	6	7	8	9	10	
How good is chocolate?												
How much do you like brussel sprouts?												

Q2. Try out this way of telling us about the theme of food - give it a star rating

How good is chocolate?						
How much do you like brussel sprouts?						

Try out these graphics too...

Q3. How good is chocolate? - move or draw the dial to show how good



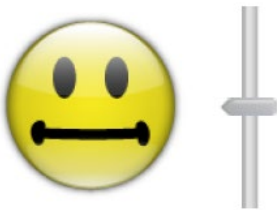
Q4. How good is chocolate? - move or draw the dial to show how good



Q5. how much do you like Brussel sprouts - red is not at all, yellow is middling, green is you like them a lot



Q6. how much do you like Brussel sprouts - a smile face is you like them , a sad face means you don't like them



Q7. Which way of answering questions did you like best, and why?

Appendix 6

Workshop 4 - session guide

This is an outline of the hybrid online-offline session which will take place on March 9th. This is a guide for teachers/group facilitators and researchers to help you help children participate. Here we provide an outline of activities. Additional resources are also provided in the email to print out for use by the class/group.

Proposed Timing during the session

0h 00m	1. Welcome to session and aims
0h 05m	2. Warm Up Activity
0h 15m	3. Choose Your Focus
0h 20m	4. Offline Activity in Classroom
0h 40m	5. Feedback Your Activity Online
0h 50m	6. What Happens Next

1.Welcome and Aims

Thank you everyone who has taken part so far. We have had lots of wonderful ideas from you about the important things about outdoor spaces, and some of you have done a lot of hard work trying to link together everyone's ideas into themes. This session is to try out different ways of asking and answering questions on the themes that you have all chosen.

The questions that children choose and create today will help us make a survey. The survey will be a way for children to rate the quality of outdoor spaces.

Today we will work together online and you will do activities in your group. If you have any questions about what is happening, please talk to the teacher or researcher who is with you.

We are videoing the session today so that groups who could not make this time can hear your ideas on another day.

2.Warm Up Activity

As today is about creating a survey, first try out a [survey we created about food](#).

Try it out online or on paper (see the FOODsurvey.pdf in this email). [Appendix 5]

3.Choosing your focus for today

The subject of that survey was food. But the subject of the survey we are making together is the quality of outdoor spaces. In all the ideas from each group and school taking part we found 5 big themes that connect your themes with the themes from other groups. This is what they look like at the moment - but the words we are using may be wrong

1. **Natural Environment** – how outdoor spaces look/smell/sound, what grows or lives there
2. **Space to do the things you want to**– activities, spaces, adventure, play areas, paths
3. **Human/Built Environment** – shelter, toilets, seating, clean, sustainably cared for
4. **Feelings** – friendliness, belonging, excited, safe, freedom to be yourself, calm
5. **Accessibility** – easy to get there, allowed to be there, near enough to home

Today we would like you to choose one of these big themes and then decide on questions that can be used about this theme in the survey.

4.Offline Activity in Classroom

[Teachers/facilitators **please print out this activity on pages 3-7** and help children take part in completing **one or two** of these themes, writing things down for them if they would like you to. If you are working with a big group they can split up into smaller groups to do the activity and we can make time for each small group to feed back. If they are working in smaller groups, please make sure each small group looks at a different theme. Each theme starts with the same question – to help everyone focus on outdoor places near where they live, but in the real survey we will only do this once]

Read this to the group: We are creating a survey about these themes

1. **Natural Environment** – how outdoor spaces look/smell/sound, what grows or lives there
2. **Space to do the things you want to**– activities, spaces, adventure, play areas, paths
3. **Human/Built Environment** – shelter, toilets, seating, clean, sustainably cared for
4. **Feelings** – friendliness, belonging, excited, safe, freedom to be yourself, calm
5. **Accessibility** – easy to get there, allowed to be there, near enough to home

For each of the themes the researchers have come up with some questions, but they think you will come up with better ones. Please choose a theme (or choose a random number from 1 to 5).

As a group talk about your theme and think about everything you have talked about in past sessions that connects to this theme. Talk about what questions work and don't work, and what is missing. Then write up to six questions that you think we

should use. You can choose our questions if you think they are good. Or change some of the words in our questions. OR write your own completely new questions.

Please also choose what sort of rating scale you think we should use for your questions (e.g. slider, stars, dial, traffic lights, smiley faces).

When you have decided on your six questions, choose someone to share these back to the online group and other children will then vote for their favourite questions from your suggestions. To feedback, you can type your questions into the chat, hold up a piece of paper to the camera or say your questions out loud for other people to hear.

Theme 1: Natural Environment

We are creating a survey about the outdoor places that are near where you live. Please fill in your ideas about the survey by writing and drawing in the yellow boxes at the end of Part a and Part b.

Part a. Starting the Survey

We will start the survey question like these in the blue boxes:

Please tick any of these places that are close to your home (no more than 45 minutes away)

- ☐ Park
- ☐ Playground
- ☐ Playing field
- ☐ Rough ground

- ☐ Woods
- ☐ Grass
- ☐ Coast/seaside/beach
- ☐ Hills/mountains

Please tell us about any other outdoor places close to where you live:

What do you think we should change about these starter questions?

Part b. Natural Environment

This theme is about how outdoor spaces look/smell/sound, what grows or lives there.

The blue box contains some example questions on this theme. In the yellow box write the questions you think are good. You can use or change questions we have suggested or write your own.

In the outdoor spaces near where you live:

How big a variety of trees and plants are there?

How much are there different places (habitats) for different animals to live?

How beautiful is it?

How interesting are the sounds and smells?

Are there enough secret or wild areas?

Is there enough access to water, like a lake or river?

What six questions do you think we should use?	What rating scale is good for this question?

Rating scales could be, for example, stars/slider/smiley/traffic light.

Theme 2: Space to do the things you want to

We are creating a survey about the outdoor places that are near where you live. Please fill in your ideas about the survey by writing and drawing in the yellow boxes at the end of Part a and Part b.

Part a. Starting the Survey

We will start the survey question like these in the blue boxes:

Please tick any of these places that are close to your home (no more than 45 minutes away)

- ☐ Park
- ☐ Playground
- ☐ Playing field
- ☐ Rough ground

- ☐ Woods
- ☐ Grass
- ☐ Coast/seaside/beach
- ☐ Hills/mountains

Please tell us about any other outdoor places close to where you live:

What do you think we should change about these starter questions?

Part b. Doing the things you want to do

This is about the place being somewhere having the areas and paths that help you do activities, have space and adventures and play.

The blue box contains some example questions on this theme. In the yellow box write the questions you think are good. You can use or change questions we have suggested or write your own.

In the outdoor spaces near where you live what do you like to do?

- ☐ Be peaceful and calm
- ☐ Be with friends
- ☐ Be with family
- ☐ Play
- ☐ Have adventures

- ☐ Walk the dog
- ☐ Climb Trees
- ☐ Swim/play in water
- ☐ Other. If other, what?

How good is the outdoor space near you for doing the things you want to do?

How good is the outdoor space near you for being with friends?

How good is the outdoor space near you for playing?

How good is the outdoor space near you for being peaceful?

How much can you have adventures in the outdoor space near you?

What questions do you think we should use?	What rating scale is good for this question?

Rating scales could be, for example, stars/slider/smiley/traffic light.

Theme 3: Human or Built Environment

We are creating a survey about the outdoor places that are near where you live. Please fill in your ideas about the survey by writing and drawing in the yellow boxes at the end of Part a and Part b.

Part a. Starting the Survey

We will start the survey question like these in the blue boxes:

Please tick any of these places that are close to your home (no more than 45 minutes away)

- ☐ Park
- ☐ Playground
- ☐ Playing field
- ☐ Rough ground

- ☐ Woods
- ☐ Grass
- ☐ Coast/seaside/beach
- ☐ Hills/mountains

Please tell us about any other outdoor places close to where you live:

What do you think we should change about these starter questions?

Part b. The Human or Built Environment

This theme is about shelter, toilets, seating, being clean and cared for, free from rubbish and sustainability.

The blue box contains some example questions on this theme. In the yellow box write the questions you think are good. You can use or change questions we have suggested or write your own.

How much do the outdoor spaces near you have the shelter you need?

How well do the outdoor spaces near you provide the comforts you need?

How well sustainably cared for are the outdoor spaces near you?

How much do you feel you can help to look after nature in the outdoor spaces near you?

How good is the seating in the outdoor spaces near you?

What questions do you think we should use?	What rating scale is good for this question?

Rating scales could be, for example, stars/slider/smiley/traffic light.

Theme 4: Feelings

We are creating a survey about the outdoor places that are near where you live. Please fill in your ideas about the survey by writing and drawing in the yellow boxes at the end of Part a and Part b.

Part a. Starting the Survey

We will start the survey question like these in the blue boxes:

Please tick any of these places that are close to your home (no more than 45 minutes away)

- ☐ Park
- ☐ Playground
- ☐ Playing field
- ☐ Rough ground

- ☐ Woods
- ☐ Grass
- ☐ Coast/seaside/beach
- ☐ Hills/mountains

Please tell us about any other outdoor places close to where you live:

What do you think we should change about these starter questions?

Part b. Feelings

This theme is about feeling like a place is friendly, feeling belonging, excited or safe in a place, and feeling that when you are there you have freedom to be yourself, and be calm.

The blue box contains some example questions on this theme. In the yellow box write the questions you think are good. You can use or change questions we have suggested or write your own.

How safe do you feel in outdoor places close to where you live?

How good do you feel in outdoor places close to where you live?

How much do you feel like you belong in the outdoor places close to where you live?

How child friendly are outdoor places close to where you live?

How exciting are outdoor places close to where you live?

What questions do you think we should use?	What rating scale is good for this question?

Rating scales could be, for example, stars/slider/smiley/traffic light.

Theme 5: Accessibility

We are creating a survey about the outdoor places that are near where you live. Please fill in your ideas about the survey by writing and drawing in the yellow boxes at the end of Part a and Part b.

Part a. Starting the Survey

We will start the survey question like these in the blue boxes:

Please tick any of these places that are close to your home (no more than 45 minutes away)

- ☐ Park
- ☐ Playground
- ☐ Playing field
- ☐ Rough ground
- ☐ Woods
- ☐ Grass
- ☐ Coast/seaside/beach
- ☐ Hills/mountains

Please tell us about any other outdoor places close to where you live:

What do you think we should change about these starter questions?

Part b. Accessibility

This theme is about how easy it is to get to the outdoor places near you, whether you feel you are allowed to be there, whether they are near enough to home

The blue box contains some example questions on this theme. In the yellow box write the questions you think are good. You can use or change questions we have suggested or write your own.

- How easy is it to get to the outdoor spaces near you?
- How much do you feel like you are allowed to use the outdoor spaces nearby?
- How easy is it for **all** local children and young people to use the outdoor spaces near you?
- Are there outdoor spaces you can use close to where you live?

What questions do you think we should use?	What rating scale is good for this question?

Rating scales could be, for example, stars/slider/smiley/traffic light.

5. Feedback Your Activity online

Now it is time to take it in turns to share your questions back to the online group. And everyone else who is listening online – please use the reaction buttons, or use your hands to give thumbs up to the questions that you really like. If you are not taking part in this live, please tell your researchers or teachers, or send us an email to say which questions you like best.

Which group wants to go first....

Reactions will be encouraged

6.What Happens Next

Thank you everyone for taking part today. We have heard some excellent ideas, and they are definitely better than some of the questions we created. Other groups are now going to take part in these same activities. When they have done that, we will count up all the votes and reactions, and then we will make a survey for us all to try out. We will send you the survey in about 2 weeks.

Any questions before we go?

Thank you for today.

Appendix 7

Pilot survey

Natural Outdoor Spaces Near You: Rating their Quality

Thank you for agreeing to try out our new survey. This survey has been created by The University of Central Lancashire with help from children across England.

We have made the survey to help children tell other people what they think about outdoor natural spaces. You may notice there are some questions that seem the same. When at least 100 children have seen the survey, we will pick the questions that work best. If there are any questions you don't want to answer you don't have to. Just leave it blank and move on to the next question.

At the end there are questions from another two short surveys we would like you to answer. This is so that we can see how well ours works.

If you have any questions about this survey, please ask the person who told you about it.

Your answers are private. You do not have to give your name. So we will not know who said what.



Are you happy to take part in the survey?

☐ Yes

☐ No

What is your age?

How would you describe yourself?

- ☐ Male
- ☐ Female
- ☐ Non-binary
- ☐ Other

What is your ethnicity?

Are you disabled?

- ☐ Yes
- ☐ No
- ☐ Don't Know
- ☐ Prefer not to answer

Where do you live?

- ☐ A city or large town
- ☐ A small town
- ☐ A village or countryside

Natural Outdoor Spaces Near You: Rating their Quality

Please answer these questions to tell us what you think.

Which of these natural outdoor spaces are close to your home (no more than 20 minutes' walk away)?

Select all places you go to by yourself or with someone else, by walking or with a mobility aid.

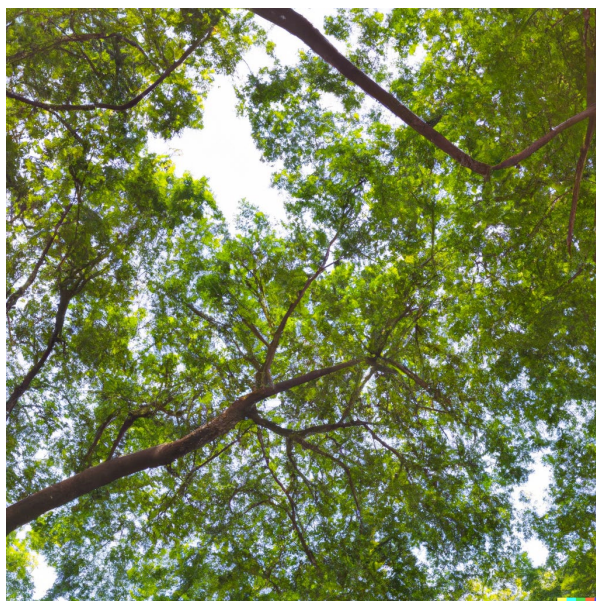
Please choose one or more options.

- ☐ Park / playing field / playground
- ☐ Grassy areas in the streets near me (e.g. a green, roadside or pathway)
- ☐ Grassy areas you pay to go to (e.g. gardens of a big house, the zoo, or city farm)
- ☐ Beach or seaside
- ☐ Woods / forest
- ☐ Fields / farmland / countryside
- ☐ Rivers / lakes / canals
- ☐ Hills/ mountains/ moorland
- ☐ Another space (not in this list)

If you have ticked Another space (not in this list), please tell us about it here:

Please answer this survey by thinking about the natural outdoor spaces near you.

1. The natural environment



Think about the natural outdoor spaces near you, that you have just told us about. Read each statement. Then mark the line to show how much you agree or disagree.

Disagree a lot

Agree a lot

0 1 2 3 4 5 6 7 8 9 10

There are lots of different kinds of trees and plants.	_____
There are lots of places for animals and birds to make their homes.	_____
There are lots of insects and other animals.	_____
There are beautiful things to see.	_____
There are lots of different colours.	_____
I can hear sounds of nature (like birds singing or buzzing bees).	_____
There are interesting and nice smells.	_____
There are many different areas to explore or play in (like water, trees, open space).	_____

2. Space to do the things you want to do



Think about the natural outdoor spaces near you. Read each statement. Then mark the line to show how much you agree or disagree.

[illegible]

3. The Human/ Built Environment



Think about the natural outdoor spaces near you. Read each statement. Then mark the line to show how much you agree or disagree.

[illegible]

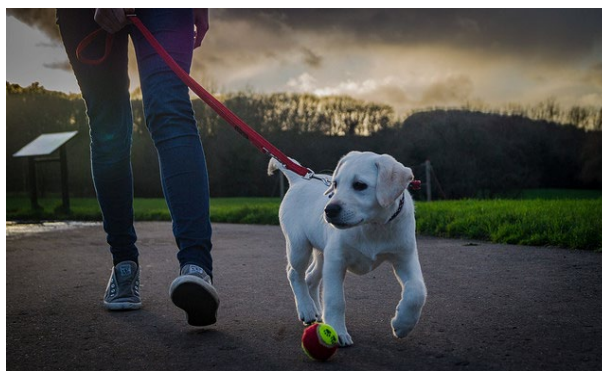
4. Feelings



Think about the natural outdoor spaces near you. Read each statement. Then mark the line to show how much you agree or disagree.

[illegible]

5. Accessibility



Think about the natural outdoor spaces near you. Read each statement. Then mark the line to show how much you agree or disagree.

Disagree a lot

Agree a lot

0 1 2 3 4 5 6 7 8 9 10

It is easy to get there by walking.	_____
I can go there by myself.	_____
I can only get there if an adult takes me in a vehicle or on public transport.	_____
It is difficult for children to be there if they are disabled.	_____
It feels like I'm not allowed to be there because I'm a child.	_____
I feel like other people don't want me to be there.	_____

6. Feelings about nature



Photo: [Frühling](#) by Marco Verch on Flickr. Used under Creative Commons ([CC BY 2.0](#)).

The following statements are about you and nature. By nature we mean all types of natural environment and all the plants and animals living in them. Nature can be close to where you live in towns; countryside or wilderness areas further away. Read each statement. Then select how much you agree or disagree.

I always find beauty in nature.

- ☐ Completely disagree
 - ☐ Strongly disagree
 - ☐ Disagree
 - ☐ Neither agree or disagree
 - ☐ Agree
 - ☐ Strongly agree
 - ☐ Completely agree
-

I always treat nature with respect.

- ☐ Completely disagree
 - ☐ Strongly disagree
 - ☐ Disagree
 - ☐ Neither agree or disagree
 - ☐ Agree
 - ☐ Strongly agree
 - ☐ Completely agree
-

Being in nature makes me very happy.

- ☐ Completely disagree
 - ☐ Strongly disagree
 - ☐ Disagree
 - ☐ Neither agree or disagree
 - ☐ Agree
 - ☐ Strongly agree
 - ☐ Completely agree
-

Spending time in nature is very important to me.

- ☐ Completely disagree
 - ☐ Strongly disagree
 - ☐ Disagree
 - ☐ Neither agree or disagree
 - ☐ Agree
 - ☐ Strongly agree
 - ☐ Completely agree
-

I find being in nature really amazing.

- ☐ Completely disagree
 - ☐ Strongly disagree
 - ☐ Disagree
 - ☐ Neither agree or disagree
 - ☐ Agree
 - ☐ Strongly agree
 - ☐ Completely agree
-

I feel part of nature.

- ☐ Completely disagree
- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree or disagree
- ☐ Agree
- ☐ Strongly agree
- ☐ Completely agree

7. How happy are you

These questions are about how happy you feel. Read each statement. Then mark the line to show how happy you feel.

1. How happy are you ... **with your life as a whole?**

VERY SAD						NOT HAPPY OR SAD						VERY HAPPY
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

2. How happy are you ... **about the things you have (like the money you have and the things you own)?**

VERY SAD						NOT HAPPY OR SAD						VERY HAPPY
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

3. How happy are you ... **with your health?**

VERY SAD						NOT HAPPY OR SAD						VERY HAPPY
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

4. How happy are you ... **with the things you want to be good at?**

VERY SAD						NOT HAPPY OR SAD						VERY HAPPY
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

5. How happy are you ... **about getting on with the people you know?**

VERY SAD						NOT HAPPY OR SAD						VERY HAPPY
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

6. How happy are you ... **about how safe you feel?**

VERY SAD						NOT HAPPY OR SAD						VERY HAPPY
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

7. How happy are you ... **about doing things away from your home?**

VERY SAD						NOT HAPPY OR SAD						VERY HAPPY
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

8. How happy are you ... **about what may happen to you later on in your life?**

VERY SAD						NOT HAPPY OR SAD						VERY HAPPY
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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Catalogue code: NECR461

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