

A Collective Call for Action for Healthy, Sustainable and Climate-Resilient Outdoor Learning and Play Settings for All Children in Canada

APRIL 2026

Evidence shows that access to nature is beneficial to nearly every facet of children's well-being, including their physical and mental health, social interactions, and readiness to learn. Outdoor spaces with tree canopy and natural surfacing can also help protect children from extreme heat and other climate-related health risks. Yet not all schools and child care programs are equipped with healthy, sustainable, and climate-resilient outdoor settings. This is a **Call for Action** to change that.

The benefits are clear and solutions exist. Now is the time for leadership and action to ensure that every child in Canada has the opportunity to learn and play in health-promoting and health-protective outdoor spaces.

Children thrive outdoors

There is robust research showing that children are healthier, more active, have enhanced learning and self-regulation of emotions and behaviours, improved social interactions, and better mental health when they have ample time in natural outdoor settings.

Outdoor play improves children's physical, cognitive, social and emotional health.^{1 2 3 4 5} Spending time outdoors is linked to greater physical activity, improved cardiorespiratory fitness, and less sedentary behaviour in children aged 3-12 years, with physical activity being higher outdoors compared to indoors.^{6 7} Likewise, risky outdoor play improves physical activity, social health and behaviour, and is associated with reduced injuries and aggression.⁸ High quality outdoor learning settings in early learning and child care programs provide benefits for child learning and development, and for protecting and promoting health and well-being, that are not available indoors.⁹

The quality and characteristics of children's outdoor settings matter. Physical parameters that are predictors of outdoor and risky play include: the size of the outdoor play space area, direct access to outdoor play spaces, and the availability

of natural elements in the outdoor play space.¹⁰ Findings from a 2023 survey of 1,187 Early Learning and Child Care (ELCC) programs across Canada demonstrated an association between increased outdoor play with having an on-site outdoor area exceeding licensing requirements.¹¹ The findings also suggest that using off-site areas can enable risky play and its associated benefits, and help mitigate limitations for child care centres that lack outdoor spaces.¹²

Green outdoor settings confer the greatest benefits.¹³ Positive health outcomes, including healthy weights, improved cognitive function, reduced anxiety and depression, and reduced Attention Deficit Hyperactivity Disorder (ADHD) symptoms, have been associated with children's frequent access to quality green spaces.¹⁴ Cognitive development in primary school children has been associated with greenness surrounding schools, homes, and commuting routes, partially attributed to reductions in exposure to air pollution.¹⁵ Evidence suggests that while everyone benefits from nearby green space, children and low-income groups may benefit the most.^{16 17 18}



A growing proportion of children in Canada are attending schools and child care programs that lack healthy and natural outdoor settings

Pollution, urbanization, other land-use pressures, and the use of artificial surfacing are reducing children’s access to healthy and natural learning/play spaces. Average greenness in Canadian cities dropped by over 8% between 2000 and 2025 with large urban centres seeing a decrease of 10.5% driven by development and urbanization.¹⁹ Children’s access to local green space in Canada ranked 15th of 40 countries on the Urban Green Space Index in 2022.²⁰

Children in neighbourhoods composed mostly of low-income, immigrant and/or racialized populations tend to have less access to green space.^{21 22} A study of three major urban centres in Canada found lower greenness prevalence (less green space) and higher nitrogen dioxide concentrations (an indicator of traffic-related air pollution) in neighbourhoods affected by socio-economic deprivation.²³

While consistent data on children’s access to health-promoting and green outdoor learning settings are lacking, examples paint a worrying picture. A citizen-science audit – “Schoolyards Count”, reported that 73% of Ontario schoolyards had an overall Schoolyard Quality Score that was less than half of the optimal score, with wealthier communities generally having higher overall scores. Only 45% of the schools audited had any kind of naturalized play spaces, and in a third of the schoolyards, 50% or more of the surface was paved.²⁴ A 2022 survey of child care professionals in Canada found that while more than two-thirds of respondents were somewhat to very concerned about children lacking connection with nature (69%) and the child health implications of air pollution (69%) and climate change (68%), 36%



Photo: Designed by Freepik (www.freepik.com)

Environmental justice and healthy outdoor learning environments

Environmental racism, the disproportionate exposure to environmental hazards (e.g., toxic exposures, air pollution, water contamination, and the impacts of climate change), impedes the realization to a right to a healthy environment for some populations in Canada, including Indigenous, Black and other racialized communities, and people living in poverty. Advancing environmental justice across Canada is foundational to ensuring that children have access to healthy outdoor learning environments.

reported pavement on all or most of the outdoor space, 26% reported a lack of vegetation, and 43% reported inadequate shade.²⁵

Without access to natural spaces, some children are missing land-based learning opportunities that help build connections within nature, improve environmental stewardship practices, and advance reconciliation – all vital to planetary health.^{26 27} Inequitable access to optimal outdoor spaces also means that some children are denied the multiple health benefits of time spent in natural spaces.

Insufficient policy action to protect the environment and ensure healthy and natural learning/play spaces can translate into higher exposures to toxic chemicals and pollution. An estimated 48% of schools in Canada are located within 200 metres of high traffic roads and thus have a higher risk of exposure to traffic pollution.²⁸ Traffic-related air pollution is responsible for approximately 2.7 million acute respiratory symptom days, 210,000 asthma symptom days and 3,600 child acute bronchitis episodes every year in Canada.²⁹ Pesticides used on and/or near outdoor learning spaces, as well as pesticide spray drift that often finds its way into non-target areas, pose risks to human health and the environment.^{30 31 32 33 34 35 36} And, as further outlined below, decisions about

surfacing materials and other infrastructure in children's play/learning spaces can also contribute to child health risks and effects on ecosystems.

Climate change is increasing health risks from exposure to climate hazards in outdoor learning settings and other spaces where children spend time

Climate change is causing more extreme weather events and increasing children's exposure to climate hazards, such as extreme heat, air pollution from wildfires and the burning of fossil-fuels, flooding and climate-sensitive disease vectors.^{37 38} ³⁹ Children's education and learning is disrupted by climate-related events that result in school closures or children missing school due to health conditions, such as asthma, that are exacerbated by such events.⁴⁰ The full extent of exposure and health impacts related to poor air quality, extreme heat and other climate-related hazards in outdoor learning settings is unknown, in part due to the lack of environmental monitoring e.g., air quality, surface temperature and air temperature monitoring.

Paved surfaces and lack of green space in built up areas are creating urban heat islands, causing temperatures to exceed those in surrounding areas, and putting children at greater risk.^{41 42} New development often results in more pavement or other artificial surfacing, which contributes further to heat retention, reduced permeability and increased flooding risk. Shrinking green space also exacerbates climate change itself, due to the loss of the essential greenhouse gas sequestration function of trees and other natural ecosystems.⁴³ A 2020 study of four Canadian cities found that socially vulnerable, multicultural neighbourhoods not only disproportionately lack urban forests, they may also be at greater risk of losing what exists due to environmental disturbances and the reduced urban forest resilience in these neighbourhoods.⁴⁴ Playground surfaces, including playground equipment, can become dangerously hot without shade protection. One study found that the hottest areas of a city neighbourhood were on playground surfaces.⁴⁵ The previously noted Schoolyards Count audit reported that 13% of Ontario schoolyards had no shade at all from tree cover, and only 20%

of schools had a lot of shade.⁴⁶ In a 2019 survey of Canadian and US topical experts involved in various aspects of play space design and safety, 83% reported that the surrounding thermal environment (e.g., shade and/or water features) was given less or significantly less priority than the structural integrity of equipment, with only 8% indicating that shade considerations had received priority in past playground designs.^{47 48}

The escalating use of plastics and other synthetic materials in learning/play environments is posing new and expanded threats to children's health and well-being

Compounding these climate-related concerns is the widespread use of plastic-laden surfacing materials, such as artificial turf, in children's learning and play areas. Artificial turf was introduced to the North American market in the 1960s,⁴⁹ with the global value of the industry in 2020 estimated to be \$2.7 billion.⁵⁰ Made primarily from fossil fuels, artificial turf, poured-in rubber surfaces, and other synthetic surfacing materials have become commonplace in early learning and child care settings, schools, and neighbourhood parks. In a 2022 survey of approximately 2,000 child care professionals, nearly 40 percent reported the presence of outdoor artificial turf at the child care setting where they work.⁵¹

Artificial surfacing is a source of children's exposure to toxic chemicals and microplastics, threatens ecological health, contributes to climate change, and makes learning settings less climate resilient.⁵² ^{53 54 55 56 57}

Children are at greater risk than adults to the harmful effects of contaminants in the environment because they often have greater exposure (closer to the ground, hand-to-mouth behaviours, breathing more air per body weight and having larger skin surface relative to body size which increases skin absorption) and because their growing bodies are more susceptible to harm.^{123,124,125}

Artificial turf is comprised of a cushioning infill, often crumb rubber, which contains toxic chemicals known to be harmful to human health and the environment including metals, polycyclic aromatic hydrocarbons (PAH), volatile organic compounds (VOC), phthalates, and other chemical additives.⁵⁸
⁵⁹ ⁶⁰ The plastic fibres and backing of artificial turf also contain harmful chemicals including polyfluoroalkyl substances (PFAS) or “forever chemicals”.⁶¹ ⁶² ⁶³ While a recently released study reported “no significant health risks to players,



Photo: Designed by Freepik (www.freepik.com)

coaches, referees and spectators from on-field or off-field exposure to chemicals in crumb rubber infill from synthetic turf fields based on the assessment method and available data”, the study did not examine the other components of artificial turf (e.g., the plastic fibre blades)

nor did it look at degradation products including microplastics, among other limitations.⁶⁴ ⁶⁵

In addition to introducing toxic chemicals and microplastics into children’s environments, artificial turf can retain heat and reach higher surface temperatures than natural grass, contributing to the urban heat island effect and increasing heat-health risks for children.⁶⁶ ⁶⁷ ⁶⁸ A recent study investigating 35 synthetic turf soccer fields observed surface temperatures at least 20°F (11°C) higher than ambient surface temperatures for most fields in the warmer months.⁶⁹

Artificial turf and other synthetic surfaces lead to stormwater run-off that can contribute to contamination of surface and groundwater sources and flooding.⁷⁰ ⁷¹ A recent study from Vancouver, B.C., found that chemicals at levels toxic to salmon can be released from crumb rubber infill material over the lifespan of the artificial turf field.⁷² Artificial turf, including the plastic blades of artificial grass, is a source of microplastics pollution in surface waters, with one study estimating that artificial turf fields contribute up to 15% of plastic pollution in aquatic environments.⁷³ The aging of rubberized playground surfaces can create smaller microplastic particles which may increase their mobility in air and stormwater.⁷⁴ ⁷⁵

Artificial turfs have a lifetime of 10 to 12 years, with environmental impacts both during their lifetime use and beyond.⁷⁶ ⁷⁷ Artificial turf generates a significant amount of plastic waste, estimated to be among the largest land-based sources of microplastics released to the environment.⁷⁸ There are reports of large stockpiles of used artificial turf and concerns about safe disposal.⁷⁹ ⁸⁰

While the full impact of artificial surfacing on ecosystems, community-level climate resiliency, and children’s health may remain elusive pending further research,⁸¹ its use in children’s learning and play settings is inconsistent with the robust body of research delineating the benefits to children of time spent in natural settings. It is also clear that natural turf or other vegetation provides much greater co-benefits for biodiversity and climate change mitigation and adaptation.⁸² ⁸³ ⁸⁴

Systems-level measures are currently lacking or insufficient in Canada to guide and ensure healthy, natural, and climate-resilient outdoor learning and play settings

There is a dearth of guidance, standards, data collection, measurable targets, investments, training, and capacity building needed to bring about the societal shift to ensure that all children in Canada have access to health-promoting, natural, and climate resilient outdoor learning and play spaces.⁸⁵

Schools and child care programs are currently under-supported with policy and guidance on

how much and what kind of outdoor spaces should be provided to maximize benefits for children. In the early learning sector, policies, regulations and practices relating to designated outdoor space for children in child care settings is inconsistent across provincial and territorial jurisdictions.⁸⁶ For example, the minimum outdoor space requirement per child for infants is 7 m² in Prince Edward Island and 2 m² in Alberta, with

some jurisdictions not requiring dedicated outdoor spaces connected to the child care centres.⁸⁷ The City of Vancouver’s Childcare Design Guidelines specify a minimum outdoor area based on the age group and the number of child care spaces at the centre – a total of 224 m² of outdoor space for 16 child care spaces and 170 m² for 12 spaces for the 3-5 age group (*averages to about 14 m² per child*).⁸⁸ The City of Toronto’s Child Care Design Guidelines emphasize that outdoor play areas should ensure that children have contact with the natural environment (i.e., plants, sand, earth, water and sun) and recommend a minimum of 25% shaded area at all times.⁸⁹

Similarly, guidance and standards may not reflect the full suite of considerations to optimize children’s well-being, especially those related to environmental health and climate-related risks. The impact of climate change (e.g., extreme heat) and other environmental factors (e.g., air pollution) on children’s health and safety in outdoor play spaces, including playground equipment, has not received the same attention or priority in playground design guidelines and standards, to date, as other design factors (e.g.,

structural integrity of equipment). The survey of playground design and safety experts mentioned earlier revealed that thermal comfort receives low or no priority. While 79% of respondents felt that climate and environmental factors such as weather or air and chemical pollution were extremely or very important, 77% indicated that these factors had not received the same priority as other safety factors (e.g., structural integrity of equipment) in the planning and development of play spaces.^{90 91}

Systematic data collection and analysis are not yet in place to demonstrate the degree to which children in varying jurisdictions, geographies, and socio-economic gradients have (or lack) access to the health-promoting benefits of access to healthy outdoor learning and play spaces. This hampers efforts to direct resources and investments in ways that would reduce health inequities and environmental injustice.

Training and capacity building are also needed to support decision-making about and maintenance of physical design features, such as artificial and natural surfacing options, and to support educators in maximizing the use of nature-based outdoor learning and play settings.

Solutions exist

Solutions exist and they have many co-benefits – for child health, learning and development, for climate-resiliency, for reconciliation, and for health equity. These solutions can also save money through healthcare costs avoided and climate risks mitigated. Many communities have already invested and are seeing the benefits. It’s time to follow their path.

- **Re-connection with, and within, nature**, through unstructured play and learning in natural outdoor settings, including nature-based education guided by local Indigenous knowledge holders, can help support environmental stewardship and advance reconciliation through strengthening understandings of history and place and deepening relationships with the land and Indigenous knowledge holders and communities.
- **Climate-resiliency measures**, such as depaving and increasing tree canopy and other vegetation, provide both climate mitigation and adaptation benefits, are an opportunity to engage children and youth in climate action and help combat eco-anxiety.
- **Selection of natural and sustainable materials, products and design features** such as plastic-free surfacing and play structures, and efforts to reduce toxic chemicals, pesticides, and microplastic pollution, can help achieve multiple health and environmental benefits while giving children direct experience of environmental stewardship.

Climate-Resilient Outdoor Learning Settings have adequate shade to regulate surface temperature and sun exposure; naturalized, pervious surfaces to reduce heat retention and protect from flood risks; measures such as vegetation barriers to reduce exposure to air pollution; and measures to reduce exposure to climate-sensitive disease vectors.

Notable **policy and position statements, guiding principles and recommendations** for healthy and sustainable outdoor learning settings exist to guide this work. These include:

- Canada's [National Framework for Environmental Learning](#) ⁹²
- Outdoor Play Canada's (2015) [Position Statement on Active Outdoor Play](#) ^{93 94}
- Outdoor Play Canada's [2025 Position Statement on Active Outdoor Play](#) ⁹⁵
- CPCHE's [Vision for Healthy and Sustainable Child Care Environments in Canada](#) ⁹⁶
- Canadian Public Health Association's [Children's Unstructured Play Position Statement](#) ⁹⁷
- Canadian Paediatric Society's Position Statement: [Healthy Childhood Development through Outdoor Risky Play](#) ⁹⁸
- [Active Outdoor Play Statement](#) from the Council of Chief Medical Officers of Health ⁹⁹
- Lawson Foundation's Statement: [Increasing Outdoor Play in Early Learning and Child Care](#) in the Context of COVID-19 ¹⁰⁰
- [Position Statement on the Use of Artificial Turf Surfaces](#) issued by the Children's Environmental Health Center of the Icahn School of Medicine ¹⁰¹

The following **practical resources** (tools, guidance) have been developed to support optimal health and well-being for all children in outdoor learning settings:

- [Designing Climate-Ready Playgrounds](#), Fundamentals for Thermal Comfort and Safety, National Program for Play Area Safety ¹⁰²
- [Children's Playground Equipment and Surfacing](#), Canadian Standards Association ¹⁰³
- [Climate Ready Schools Guide to Child-Friendly Participatory Design](#), Evergreen ¹⁰⁴
- [Flood:ED School Greening Simulator](#), GreenLearning ¹⁰⁵
- [Climate Sensitive Infectious Diseases - Teacher's Kit](#), Canadian Public Health Association ¹⁰⁶
- [A Community Guide to Nature Play](#), Evergreen ¹⁰⁷
- [Teacher's Guidebook for Bringing Learning Outside](#), Child & Nature Alliance of Canada ¹⁰⁸
- [Unstructured Play Toolkit](#), Canadian Public Health Association ¹⁰⁹
- [Risk-Benefit Assessment for Outdoor Play](#), Child & Nature Alliance of Canada ¹¹⁰
- [Shade Lookbook](#), A Guide to Designing Sun Safety ¹¹¹
- [Outside Play Toolkit](#), Outside Play UBC Lab ¹¹²
- [Outdoor Play Resource Library](#), Outdoor Play Canada ¹¹³
- [Child Care Checklist and Resource Hub](#), CPCHE and the Canadian Child Care Federation (CCCCF) ¹¹⁴
- [School Siting Guidelines](#), United States Environmental Protection Agency ¹¹⁵

These **promising practices** demonstrate that creating healthy, equitable, sustainable, and climate-resilient outdoor learning settings is achievable and has multiple co-benefits:

- [Climate-Ready Schools](#), Evergreen ¹¹⁶
- [Healthy by Nature/Learning by Nature](#), BC Parks Foundation ¹¹⁷
- [School Ground Nature Parks](#), BC Parks Foundation ¹¹⁸
- [The Nature School](#), Toronto Region Conservation Authority ¹¹⁹
- [Depave Paradise](#), Green Communities Canada ¹²⁰
- [Planting for Change](#) (P4C), Association for Canadian Educational Resources ¹²¹
- [Space to Grow](#), Greening Chicago Schoolyards ¹²²

The Collective Call for Action:

Recognizing the evidence that in Canada:

- many children are lacking physical activity and connection with nature,
- mental health concerns and eco-anxiety in children and youth are increasing,
- climate hazards such as extreme heat, air pollution, and vector-borne diseases are impacting children’s health and exacerbating health inequities,
- the triple planetary crises of climate change, pollution, and biodiversity loss are threatening children’s health and well-being, now and into the future,
- children are at greater risk than adults from exposure to and effects from toxic substances, climate hazards, and other environmental stressors,^{123 124 125}
- there is growing recognition of the benefits of naturalizing outdoor learning spaces and examples of where this has been successfully implemented, and
- benefits to children’s learning, health, and well-being can be realized by increasing children’s time spent in healthy and natural outdoor settings.

The Canadian Partnership for Children’s Health and Environment (CPCHE), with our partners, affiliates and collaborators, calls upon governmental decision-makers at all levels to work in consultation with key stakeholders, including educators, administrators, public health officials, urban planners, Indigenous knowledge holders, and youth, to:

1. ensure that children’s outdoor learning environments (*child care settings, schools, community parks and other proximate public spaces*) are equipped (*designed, built/refurbished and maintained*) and accessible to prioritize optimal child health, well-being, and development, including health protection, health promotion, and climate-resiliency, *and*
2. establish the leadership, policy frameworks, and accountability needed to shift the trajectory away from shrinking and often synthetically surfaced and plastics-reliant outdoor spaces towards abundant, healthy, natural, and climate-resilient outdoor learning and play environments for all children in Canada.



To achieve this, decisive action is needed in five domains:

1. Develop standards, guidelines, and implementation supports

Recognizing children’s right to a healthy environment,¹²⁶ the evidence linking outdoor play to child health and well-being, the stressors that are contributing to the loss of greenspace and the escalation of climate- and toxics-related health risks, establish and implement policies to:

- Protect children’s outdoor learning and play spaces from development pressures by strengthening parkland/greenspace provisions in land-use planning policies.
- Establish provincial/territorial legislative requirements and related policies at the municipal and school board/child care levels for designated healthy and sustainable outdoor spaces at schools and child care settings and to ensure access to public/community spaces for existing schools/programs that have no or very limited outdoor space.
- Develop design standards and guidance for healthy, sustainable, and climate-resilient outdoor learning settings, including: (a) specifications/guidance for siting, and other measures such as vegetative barriers, to protect children from traffic and other proximate sources of pollution; (b) guidelines for natural landscaping; (c) restrictions on the use of plastics and other materials containing toxic chemicals to protect children and local ecosystems; (d) guidance on selecting outdoor play affordances that meet the needs and desires of children (e.g., risky play in ecologically rich environments); (e) minimum outdoor space requirements/guidance; and (f) other measures, as needed, through consultation with relevant stakeholders and informed by scientific, technical, Indigenous, and grounded expertise.^{127 128 129}
- Promote and require, where applicable, measures to ensure that outdoor spaces and learning settings are equipped to mitigate the effects of extreme heat and other climate-related concerns (e.g., flooding, air pollution) by: (a) maximizing natural and constructed seasonal shade; (b) prioritizing natural surfaces and restricting the use of tarmac/pavement and other impervious surfacing, including artificial turf and other synthetic materials; (c) incorporating green infrastructure for both climate and air pollution mitigation and climate adaptation;^{130 131} and (d) setting up local air quality and temperature monitors.
- Incorporate climate risks and adaptive capacity related to outdoor learning settings (e.g., exposure to extreme heat, air pollution, flooding, vector-borne diseases) in public health agencies’ climate and health assessments, and work across sectors to increase climate resiliency within these settings through nature-based solutions and other actions with health co-benefits.
- Provide the requisite training, funding, incentives, and other supports to ensure timely and equitable implementation of the above measures.

Indigenous Self-Determination in Education

This Collective Call for Action does not identify specific policy actions linked to Indigenous education, early learning and child care. We recognize and affirm the rights of Indigenous governments to design and develop educational systems and services that are distinctions-based and self-governed, consistent with the vision and principles set out in the [Indigenous Early Learning and Child Care Framework](#) and commitments under the [United Nations Declaration on the Rights of Indigenous Peoples](#). We further note the relevant Calls to Action in the report of the [Truth and Reconciliation Commission of Canada](#), including the responsibility of the federal government to eliminate the discrepancy in education funding for First Nations children being educated on reserves and those being educated off reserves.

2. Promote outdoor and land-based learning and connections with nature

Integrate land-based learning and build literacy and supports for nature-health connections:

- Encourage and adopt land-based learning for children and youth, including engaging with local knowledge holders to support understanding of Indigenous ways of knowing. Respectfully and meaningfully recognize Indigenous expertise and perspectives in nature-based learning, including recognizing the reciprocal relationship, the land as teacher, and the importance of giving back through stewardship, gratitude, and respect.
- Increase societal literacy, including among educators, facilities personnel, decision-makers, children and youth, around the concepts of planetary health, nature-environment/human health interdependencies, the ecological and human health risks inherent in the life cycle of plastics and other toxic substances, and the interconnectedness of all living things, recognizing that we are a part of nature, not apart from nature.

3. Investments

Recognizing the untapped potential to advance children's health and well-being, now and into the future, through investment in the spaces where many spend the majority of their waking weekday hours:

- Invest in designing, building/retrofitting, and maintaining healthy, natural, and climate-resilient outdoor learning and play spaces through funding and incentive programs at federal, provincial/territorial, and local levels.
- Prioritize such investments in under-served and socio-economically marginalized communities, and in neighbourhoods at increased risk of climate-hazards.
- Invest in training and capacity-building so that all actors in this space (educators, playground designers, inspectors, municipal parks staff, urban planners, administrators, etc.) have the knowledge and skills to ensure that outdoor learning environments are health-promoting, health protective, and climate-resilient.

Canada's Child Care Expansion - A Moment of Opportunity

Canada's investment in early learning and child care is an opportunity to concurrently help meet the country's climate and sustainability goals. ([Akbari & Vinet, 2022](#)) Incorporating nature-based solutions such as tree planting and green spaces – an integral part of Canada's [Emissions Reduction Plan](#) – into [Early Learning and Child Care Agreements](#) – can help create high-quality child care settings with health and climate co-benefits.

4. Data collection, indicators and accountability

Collect and analyze data and establish public-facing indicators of equitable implementation and impact, including:

- Environmental health indicators (e.g., location, quantity, and quality of outdoor learning environments, shade provisions, surface temperatures, air quality including traffic-related air pollution, flood risks, other climate hazards, chemical hazard exposures, provision of natural versus artificial surfaces), and
- Equity indicators (e.g., location of greenspace in proximity to schools and child care programs in under-served communities, access to outdoor learning, socio-economic demographics).

5. Collaboration

Recognizing the all-of-society vision and commitment required to shift towards the prioritization of healthy, sustainable, and climate-resilient learning and play settings for all children, we call on elected officials and governmental decision-makers to:

- Optimize and coordinate guidance, standards-setting, targets, and investments across all levels of government and ministries (education, health, environment, infrastructure, natural resources, municipal affairs) to realize the benefits of outdoor learning for child health, well-being, learning and development, climate-resiliency, and economic prosperity:
 - o Federal: Provide health evidence and develop/support guidance for climate-resilient, health-protective and health-promoting outdoor learning and play spaces including equipment and surfacing; support climate adaptation planning, measurement and indicators.
 - o Provincial/Territorial: Work across ministries of education, health, environment, and other relevant departments to identify and prioritize actions to achieve healthy and sustainable outdoor learning and play environments for all children.
 - o Municipal: Work with school boards, communities, and local agencies to coordinate climate action planning, land-use and development policies, and municipal infrastructure planning including parklands, with an aim to protect and promote healthy and sustainable outdoor learning environments. Adopt shared-use agreements with schools and child care settings.
- Leverage objectives and targets within federal/provincial/territorial/municipal climate mitigation and climate adaptation action plans to better equip outdoor learning environments at schools and child care settings to protect and promote child health and well-being, and advance equity and climate and environmental justice,¹³² including but not limited to:
 - o overlapping objectives across the five interconnected systems within Canada's National Adaptation Strategy, such as "**improving health and well-being**: Climate action across all sectors promotes good health and prioritizes measures that have multiple benefits (e.g., protecting health and improving environmental sustainability)", and, "**protecting and restoring nature and biodiversity**: The use of nature-based solutions is accelerated to increase resilience and maximize co-benefits such as reducing stress on grey infrastructure, increasing social benefits of nature, and climate change mitigation."¹³³
 - o opportunities identified in Canada's National Framework for Environmental Learning for school grounds to support provincial and territorial conservation efforts under *Canada's Commitments for Nature*.¹³⁴
- Provide the vision, leadership and investments to position Canada as a global leader in healthy and sustainable environments for children, and to ensure that current and future generations of children in Canada reap the multiple benefits of a childhood spent in healthy, ecologically connected and climate-resilient natural settings that support their physical, mental and emotional health, reduce eco-anxiety, nurture their curiosity, support social connections, and epitomize a healthy and sustainable future.

Signatories

In solidarity and with determination for the health and well-being of our nation's children and future generations, this Call for Action is advanced collectively by:

Canadian Partnership for Children's Health and Environment (CPCHE)
 Canadian Public Health Association (CPHA)*
 Canadian Child Care Federation (CCCCF)*
 Canadian Association of Nurses for the Environment (CANE)*
 Canadian Association of Physicians for the Environment (CAPE)*
 CAPE - Manitoba Committee
 CAPE - New Brunswick Committee
 CAPE - Newfoundland and Labrador Committee
 CAPE - Nova Scotia Committee
 CAPE - Ontario Committee
 Canadian Environmental Law Association (CELA)*
 Environmental Health Clinic at Women's College Hospital*
 Learning Disabilities Association of Canada (LDAC)*
 Ontario Public Health Association (OPHA)*
 Pollution Probe*
 Centre for Environmental Health Equity (CEHE)**
 Little Things Matter**
 Prenatal Environmental Health Education (PEHE) Collaboration**
 Association for Canadian Educational Resources (ACER)
 Association of Early Childhood Educators of Alberta (AECEA)
 Association of Early Childhood Educators of Newfoundland and Labrador (AECENL)
 Breast Cancer Action Quebec (BCAQ)
 Canadian Health Association for Sustainability & Equity (CHASE)
 Canadian Institute of Public Health Inspectors - Ontario (CIPHI-O)
 Canadian Lung Association
 Child and Nature Alliance of Canada
 Children's Environmental Health Clinic (ChEHC)
 Clean Indoor Air Toronto

Climate Action Partnership
 Early Childhood Educators of Yukon Territory (ECEYT)
 École Les Mélèzes dorés
 EcoSchools Canada
 Environmental Defence
 Evergreen
 Forests Canada
 For Our Kids
 Friends of Tecumseh's Forests (FOTF)
 Green Communities Canada
 GreenLearning
 Greys For Green
 Human and Environmental Physiology Research Unit, University of Ottawa
 Human Early Learning Partnership, University of British Columbia
 Manitoba Child Care Association (MCCA)
 Lung Association of New Brunswick
 Ontario School Safety
 Outdoor Play Canada
 Outside Play Lab
 Rewilding Native Gardens
 Seniors for Climate Action Now!
 Saskatchewan Early Childhood Association (SECA)
 Support Our Students Alberta!
 Sustainable Buildings Canada
 Take Me Outside
 Windfall Ecology Centre

*CPCHE Partner organization
 **CPCHE Affiliate organization



LAWSON FOUNDATION

CPCHE and lead partner CPHA gratefully acknowledge the generous support of the Lawson Foundation for the 2026 Healthy Environments for Learning Day (HELD) campaign.



References

- Ginsburg, K.R. (2007) American Academy of Pediatrics Committee on Communications; American Academy of Pediatrics Committee on Psychosocial Aspects of Child and Family Health. The importance of play in promoting healthy child development and maintaining strong parent-child bonds. *Pediatrics*. 2007 Jan;119(1):182-91. doi: 10.1542/peds.2006-2697. PMID: 17200287. <https://pubmed.ncbi.nlm.nih.gov/17200287/>
- Burdette HL, Whitaker RC. (2005) Resurrecting free play in young children: looking beyond fitness and fatness to attention, affiliation, and affect. *Arch Pediatr Adolesc Med*. 2005 Jan;159(1):46-50. doi: 10.1001/archpedi.159.1.46. PMID: 15630057. <https://pubmed.ncbi.nlm.nih.gov/15630057/>
- Ramsden, R., Forer, B., Hussaina, H., Han, C., Bouchard, C., Crane, J., et al. (2026) Examining outdoor play associations in Canadian early learning and child care centres: Cross-sectional insights from the Measuring Early Childhood Outside survey. *PLoS One* 21(2): e0331166. <https://doi.org/10.1371/journal.pone.0331166>
- Ernst J, Stelley H. (2024) Supporting Young Children's Self-Regulation Through Nature-Based Practices in Preschool. *Behav Sci (Basel)*. 2024 Oct 31;14(11):1013. doi: 10.3390/bs14111013. PMID: 39594313; PMCID: PMC11591543. <https://pmc.ncbi.nlm.nih.gov/articles/PMC11591543/>
- Moreira, M., Cordovil, R., Lopes, F., Da Silva, B. M. S., & Veiga, G. (2022). The Relationship between the Quality of Kindergartens' Outdoor Physical Environment and Preschoolers' Social Functioning. *Education Sciences*, 12(10), 661. <https://doi.org/10.3390/educsci12100661>
- de Lannoy, L., James, M. E., Badruddin, Z., Thankarajah, A., Bakalár, P., Barnett, L. M., Bentsen, P., Brazo-Sayavera, J., Carson, V., Down, M. J., Duncan, S., Fahey, R., Harper, N. J., Johnstone, A., Lang, J. J., Larouche, R., Lee, E., Lopes, O., Manyanga, T., McCurdy, A. P., McGarty, A. M., Mygind, L., Prince, S. A., Prioreschi, A., Ryu, S., Sikora, L., Tucker, P., Vanderloo, L. M., Wachira, L., & Tremblay, M. S. (2026). Association Between Active Outdoor Play and Health Among Children, Adolescents, and Adults: An Umbrella Review. *Journal of Physical Activity and Health*, 23(4), 452-467. Retrieved Apr 3, 2026, from <https://doi.org/10.1123/jpah.2025-0391>
- Gray, Casey & Gibbons, Rebecca & Larouche, Richard & Beate, Ellen & Sandseter, Ellen Beate Hansen & Bienenstock, Adam & Brussoni, Mariana & Chabot, Guylaine & Herrington, Susan & Janssen, Ian & Pickett, William & Power, Marlene & Stanger, Nick & Sampson, Margaret & Tremblay, Mark. (2015). What is the Relationship between Outdoor Time and Physical Activity, Sedentary Behaviour, and Physical Fitness in Children? A Systematic Review. *International Journal of Environmental Research and Public Health*. 12. 6455-6474. 10.3390/ijerph120606455.
- Brussoni M, Gibbons R, Gray C, Ishikawa T, Sandseter EB, Bienenstock A, Chabot G, Fuselli P, Herrington S, Janssen I, Pickett W, Power M, Stanger N, Sampson M, Tremblay MS. (2015) What is the Relationship between Risky Outdoor Play and Health in Children? A Systematic Review. *Int J Environ Res Public Health*. 2015 Jun 8;12(6):6423-54. doi: 10.3390/ijerph120606423. PMID: 26062038; PMCID: PMC4483710. <https://pubmed.ncbi.nlm.nih.gov/26062038/>
- Lawson Foundation. Increasing Outdoor Play in Early Learning and Child Care in the Context of COVID-19. July 2020. English version available at <http://www.lawson.ca/op-elcc-covid19.pdf>. French version available at <http://www.lawson.ca/op-elcc-covid-19-fr.pdf>.
- Ramsden, R., Forer, B., Hussaina, H., Han, C., Bouchard, C., Crane, J., et al. (2026) Examining outdoor play associations in Canadian early learning and child care centres: Cross-sectional insights from the Measuring Early Childhood Outside survey. *PLoS One* 21(2): e0331166. <https://doi.org/10.1371/journal.pone.0331166>
- Ramsden, R., Forer, B., Hussaina, H., Han, C., Bouchard, C., Crane, J., et al. (2026) Examining outdoor play associations in Canadian early learning and child care centres: Cross-sectional insights from the Measuring Early Childhood Outside survey. *PLoS One* 21(2): e0331166. <https://doi.org/10.1371/journal.pone.0331166>
- Ramsden, R., Forer, B., Hussaina, H., Han, C., Bouchard, C., Crane, J., et al. (2026) Examining outdoor play associations in Canadian early learning and child care centres: Cross-sectional insights from the Measuring Early Childhood Outside survey. *PLoS One* 21(2): e0331166. <https://doi.org/10.1371/journal.pone.0331166>
- Simcoe Muskoka District Health Unit. (2016) Naturalized Outdoor Play Areas at Schools to Support Physical Activity and Health – A Rapid Evidence Review. <https://www.simcoemuskokahealth.org/docs/default-source/hu-library/reports/naturalplayevidencereviewfinalv2.pdf?sfvrsn=6>
- Toronto Public Health. (2015). Green City: Why nature matters to health – An Evidence Review. Toronto, Ontario <https://www.toronto.ca/legdocs/mmis/2015/hl/bgrd/backgroundfile-83421.pdf>
- Dadvand, P., Nieuwenhuijsen, M.J., Esnaola, M., Forns, J., Basagaña, X., Alvarez-Pedrerol, M., Rivas, I., López-Vicente, M., De Castro Pascual, M., Su, J., Jerrett, M., Querol, X., & Sunyer, J. (2015) Green spaces and cognitive development in primary schoolchildren. *Proc. Natl. Acad. Sci. U.S.A.* 112 (26) 7937–7942. <https://doi.org/10.1073/pnas.1503402112>
- Toronto Public Health. (2015). Green City: Why nature matters to health – An Evidence Review. Toronto, Ontario <https://www.toronto.ca/legdocs/mmis/2015/hl/bgrd/backgroundfile-83421.pdf>
- Stevenson, K. T., Moore, R., Cosco, N., Floyd, M. F., Sullivan, W., Brink, L., Gerstein, D., Jordan, C., & Zaplatosch, J. (2020). A national research agenda supporting green schoolyard development and equitable access to nature. *Elem Sci Anth*, 8(1), 406. <https://online.ucpress.edu/elementa/article/8/1/406/115879/A-national-research-agenda-supporting-green>
- Canadian Wildlife Federation. Issue Brief. Equitable Access to Nature-based Learning. [n.d.] https://cwf-fcf.org/content/dam/cwfbepm/assets/issue_brief_equitable_access_en.pdf#:~:text=Naturalized,lower%2Dincome%20and%20racialized%20neighbourhoods
- Statistics Canada. Census of Environment: Urban greenness, 2025. [website accessed April 10, 2026] <https://www150.statcan.gc.ca/n1/daily-quotidien/251117/dq251117c-eng.htm>
- UNICEF Report Card (2022). The Future is Now. <https://www.unicef.ca/sites/default/files/2023-06/Report%20Card%2017%20Canadian%20Companion.pdf>
- UNICEF Report Card (2022). The Future is Now. <https://www.unicef.ca/sites/default/files/2023-06/Report%20Card%2017%20Canadian%20Companion.pdf>
- Potts, J. G., & Coughlin, C. C. (2019). Playground shade availability and socioeconomic position of students at St. Louis public elementary schools. *JAMA Dermatology*, 155(10), 1192–1193. <https://jamanetwork.com/journals/jamadermatology/fullarticle/2740807>
- Doiron, D., Setton, E.M., Shairsingh, K., Brauer, M., Hystad, P., Ross, N.A., Brook, J.R. (2020) Healthy built environment: Spatial patterns and relationships of multiple exposures and deprivation in Toronto, Montreal and Vancouver. *Environment International*, Volume 143, 2020, 106003, ISSN 0160-4120, <https://doi.org/10.1016/j.envint.2020.106003>. (<https://www.sciencedirect.com/science/article/pii/S0160412020319589>)
- Gallagher-Mackay, K., Corso, C. & Shubat, T. (2021). Schoolyards count: How Ontario's schoolyards measure up for health, physical activity and environmental learning. Toronto: Opeha. https://www.outdoorplaycanada.ca/wp-content/uploads/2021/10/SchoolyardsCount_Report_FINAL.pdf
- Canadian Partnership for Children's Health and Environment. (2023). 2022 Child Care Survey - Canadian Partnership for Children's Health and Environment (CPCHE). <https://healthyenvironmentforkids.ca/held/2022-child-care-survey/>
- Government of Canada. (2025) Canada's National Framework for Environmental Learning. <https://www.canada.ca/en/services/environment/weather/climatechange/get-involved/advancing-literacy/national-framework.html>
- BC Parks Foundation. (2026) Healthy by Nature. Learning by Nature. "We're transforming schoolgrounds and empowering youth to learn about nature in nature." <https://www.healthbynature.ca/learning-by-nature> School Ground Nature Parks. <https://www.healthbynature.ca/learning-by-nature-get-involved#gnp> BC Parks Foundation (News Release March 4, 2026) <https://bcparksfoundation.ca/updates/learning-by-nature-launches-across-canada/>
- Health Canada. (2022). Exposure to Traffic-Related Air Pollution in Canada: An Assessment of Population Proximity to Roadways. https://publications.gc.ca/collections/collection_2022/sc-hc/H144-99-2022-eng.pdf
- Health Canada. (2022). Health Impacts of Traffic-Related Air Pollution in Canada https://publications.gc.ca/collections/collection_2022/sc-hc/H144-91-2022-eng.pdf
- Anderson, A., A. Code, R. Malfi, C. Holladay, and M. L. Forister. (2025). An assessment of risk to pollinators from mosquito control in residential settings *Stacks Journal*: 25013. <https://doi.org/10.60102/stacks-25013>. <https://stacksjournal.org/article/anderson-25013/>
- Linhart, C., Niedrist, G.H., Nagler, M. et al. (2019) Pesticide contamination and associated risk factors at public playgrounds near intensively managed apple and wine orchards. *Environ Sci Eur* 31, 28 (2019). <https://doi.org/10.1186/s12302-019-0206-0>
- Health Canada. (2020). Pesticide spray drift near homes. [accessed April 4th, 2026] <https://www.canada.ca/en/health-canada/services/about-pesticides/pesticide-spray-drift-near-homes.html>
- Health Canada. (2023). Re-evaluation Decision RV2023-06, Pyrethrings and Its Associated End-use Products [accessed April 4th 2026] <https://www.canada.ca/en/health-canada/services/consumer-product-safety/reports-publications/pesticides-pest-management/decisions-updates/reevaluation-decision/2023/pyrethrins.html>
- National Collaborating Centre for Environmental Health. (2023). Increased Use of Pyrethroids in Canadian Households: Should We Be Concerned? Jan 2013. <https://nceeh.ca/resources/evidence-reviews/increasing-use-pyrethroids-canadian-households-should-we-be-concerned>
- van Balen, E.C., Wolansky, M.J., Kosatsky, T. (2012) Increasing use of pyrethroids in Canadian households: should we be concerned? *Can J Public Health*. 2012 Nov 7;103(6):e404-7. doi: 10.1007/BF03405626. PMID: 23618016; PMCID: PMC6975195. <https://pubmed.ncbi.nlm.nih.gov/23618016/>
- Turner, M. C., Wigle, D. T., & Krewski, D. (2010). Residential pesticides and childhood leukemia: a systematic review and meta-analysis. *Environmental health perspectives*, 118(1), 33–41. <https://pubmed.ncbi.nlm.nih.gov/20056585/>
- Berry, P., & Schnitter, R. (Eds.). (2022). Health of Canadians in a Changing Climate: Advancing our Knowledge for Action. Ottawa, ON: Government of Canada. <https://changingclimate.ca/health-in-a-changing-climate/>
- United Nations Children's Fund (UNICEF). (2021). The Climate Crisis is a Child Rights Crisis: Introducing the Children's Climate Risk Index. <https://www.unicef.org/media/105376/file/UNICEF-climate-crisis-child-rights-crisis.pdf>
- Sidik, S. (2025). Climate change impacts have potentially big repercussions for kids' education. *Proc Natl Acad Sci U S A*. 2025 Apr;122(13):e2505073122. doi: 10.1073/pnas.2505073122. Epub 2025 Mar 26. PMID: 40138343; PMCID: PMC12002182.
- Sidik, S. (2025). Climate change impacts have potentially big repercussions for kids' education. *Proc Natl Acad Sci U S A*. 2025 Apr;122(13):e2505073122. doi: 10.1073/pnas.2505073122. Epub 2025 Mar 26. PMID: 40138343; PMCID: PMC12002182.
- Berry, P., & Schnitter, R. (Eds.). (2022). Health of Canadians in a Changing Climate: Advancing our Knowledge for Action. Ottawa, ON: Government of Canada. <https://changingclimate.ca/health-in-a-changing-climate/>
- Turner-Skoff, J.B., Cavender, N. (2019). The benefits of trees for livable and sustainable communities. *Plants, People, Planet*. 2019;1:323–335. <https://doi.org/10.1002/ppp3.39>
- Ontario Public Health Association. (2023). OPHA submission to ERO 019-6813 – Review of proposed policies adapted from 'A Place to Grow' and 'Provincial Policy Statement' to form a new provincial policy instrument. https://opha.on.ca/wp-content/uploads/2023/07/OPHAs-submission-incl-appendix-re-ERO-019-6813_July_26_2023.pdf?text=pdf
- Landry, F., Dupras, J., Messier, C. (2020) Convergence of urban forest and socio-economic indicators of resilience: A study of environmental inequality in four major cities in eastern Canada. *Landscape and Urban Planning*, Volume 202, 2020, 103856, ISSN 0169-2046, <https://doi.org/10.1016/j.landurbplan.2020.103856>. (<https://www.sciencedirect.com/science/article/pii/S0169204619313349>)

- 45 Vanos, J. K., et al. (2016). Hot playgrounds and children's health: A multiscale analysis of surface temperatures in Arizona, USA. *Landscape and Urban Planning*, 146, 29–42. <https://www.sciencedirect.com/science/article/abs/pii/S0169204615002182?via%3Dihub>
- 46 Gallagher-Mackay, K., Corso, C. & Shubat, T. (2021). Schoolyards count: How Ontario's schoolyards measure up for health, physical activity and environmental learning. Toronto: Ophea. https://www.outdoorplaycanada.ca/wp-content/uploads/2021/10/SchoolyardsCount_Report_FINAL.pdf
- 47 Kennedy, E., Olsen, H., & Vanos, J. (2020). Thermally comfortable playgrounds: A review of literature and survey of experts. The Standards Council of Canada. https://scc-ccn.ca/system/files/2024-07/scc_playgrounds_report_v_1.1_en.pdf
- 48 Vecellio, D., Vanos, J., Kennedy, E., Olsen, H., & Richardson, G. (2022). An Expert Assessment On Playspace Designs And Thermal Environments In A Canadian Context. *Faculty Publications*. 5302. <https://scholarworks.uni.edu/facpub/5302>
- 49 Jastifer, J. R., McNitt, A. S., Mack, C. D., Kent, R. W., McCullough, K. A., Coughlin, M. J., & Anderson, R. B. (2019). Synthetic Turf: History, Design, Maintenance, and Athlete Safety. *Sports health*, 11(1), 84–90. <https://doi.org/10.1177/1941738118793378>
- 50 Murphy, M., & Warner, G. R. (2022). Health impacts of artificial turf: Toxicity studies, challenges, and future directions. *Environmental pollution (Barking, Essex : 1987)*, 310, 119841. <https://doi.org/10.1016/j.envpol.2022.119841>
- 51 Canadian Partnership for Children's Health and Environment. (2023). 2022 Child Care Survey - Canadian Partnership for Children's Health and Environment (CPCHE). <https://healthyenvironmentforkids.ca/held/2022-child-care-survey/>
- 52 Canadian Partnership for Children's Health and Environment. Healthy Environments for Learning Day. 2025 Campaign. <https://healthyenvironmentforkids.ca/held/2025-campaign-call-for-action/>
- 53 Vaezsfar, S., & Diamond, M. (2026). Background: Artificial Turf and Other Synthetic Surfacing - Risks for Children's Health and the Environment. McMaster University & University of Toronto. <https://healthyenvironmentforkids.ca/2026/04/23/background-artificial-surfacing/>
- 54 Toronto Public Health. (2015). Health Impact Assessment of the Use of Artificial Turf in Toronto. April 2015. City of Toronto. https://www.toronto.ca/wp-content/uploads/2017/11/9180-HIA_on_Artificial_Turf_Summary_Report_Final_2015-04-01.pdf
- 55 de Haan, W.P., Quintana, R., Vilas, C., Cózar, A., Canals, M., Uviedo, O., Sanchez-Vidal, A. (2023). The dark side of artificial greening: Plastic turfs as widespread pollutants of aquatic environments, *Environmental Pollution*, Volume 334, 2023, 122094, ISSN 0269-7491, <https://doi.org/10.1016/j.envpol.2023.122094>. (<https://www.sciencedirect.com/science/article/pii/S0269749123010965>)
- 56 Ryan-Ndegwa, S., et al. (2024). Exploring the human health impact of artificial turf worldwide: A systematic review. *Environmental Health Insights*, 18, 11786302241306291 <https://journals.sagepub.com/doi/10.1177/11786302241306291>
- 57 Cumberbatch, I. S., Richardson, L., Grant-Bier, E., Kayali, M., Mbithi, M., Riviere, R. F., Xia, E., Spinks, H., Mills, G., & Tuininga, A. R. (2025). Artificial Turf Versus Natural Grass: A Case Study of Environmental Effects, Health Risks, Safety, and Cost. *Sustainability*, 17(14), 6292. <https://doi.org/10.3390/su17146292>
- 58 California's Office of Environmental Health Hazard Assessment (2026). California Environmental Protection Agency. 2026 <https://oehha.ca.gov/sites/default/files/media/2026-03/oehhatuffinal.pdf> <https://oehha.ca.gov/risk-assessment/report/release-final-report-synthetic-turf>
- 59 Collaborative for Health & Environment. (2026). Waste Tires in Artificial Turf Infill: Understanding OEHA's health risk assessment (Part 1). April 2, 2026. [https://www.healthandenvironment.org/latest-research/blog/understanding-oehas-tire-crumb-risk-assessment-\(part-1\)-the-study-and-the-press-release](https://www.healthandenvironment.org/latest-research/blog/understanding-oehas-tire-crumb-risk-assessment-(part-1)-the-study-and-the-press-release)
- 60 Murphy, M., & Warner, G. R. (2022). Health impacts of artificial turf: Toxicity studies, challenges, and future directions. *Environmental pollution (Barking, Essex : 1987)*, 310, 119841. <https://doi.org/10.1016/j.envpol.2022.119841>
- 61 Lowell Center for Sustainable Production. University of Massachusetts Lowell. (2024). Per- and Poly-fluoroalkyl Substances (PFAS) in Artificial Turf. <https://www.uml.edu/research/lowell-center/athletic-playing-fields/pfas-in-artificial-turf.aspx>
- 62 Collaborative for Health & Environment. (2026). Waste Tires in Artificial Turf Infill: Understanding OEHA's health risk assessment (Part 1). April 2, 2026. [https://www.healthandenvironment.org/latest-research/blog/understanding-oehas-tire-crumb-risk-assessment-\(part-1\)-the-study-and-the-press-release](https://www.healthandenvironment.org/latest-research/blog/understanding-oehas-tire-crumb-risk-assessment-(part-1)-the-study-and-the-press-release)
- 63 National Collaborating Centre for Environmental Health. (2025). Artificial turf playing fields: A review of the evidence on health risks and environmental concerns. <https://nccch.ca/resources/evidence-reviews/artificial-turf-playing-fields-review-evidence-health-risks-and>
- 64 California's Office of Environmental Health Hazard Assessment. California Environmental Protection Agency. (2026). <https://oehha.ca.gov/sites/default/files/media/2026-03/oehhatuffinal.pdf> <https://oehha.ca.gov/risk-assessment/report/release-final-report-synthetic-turf>
- 65 Collaborative for Health & Environment. (2026). Waste Tires in Artificial Turf Infill: Understanding OEHA's health risk assessment (Part 1). April 2, 2026. [https://www.healthandenvironment.org/latest-research/blog/understanding-oehas-tire-crumb-risk-assessment-\(part-1\)-the-study-and-the-press-release](https://www.healthandenvironment.org/latest-research/blog/understanding-oehas-tire-crumb-risk-assessment-(part-1)-the-study-and-the-press-release)
- 66 Vaezsfar, S., & Diamond, M. (2026). Background: Artificial Turf and Other Synthetic Surfacing - Risks for Children's Health and the Environment. McMaster University & University of Toronto. <https://healthyenvironmentforkids.ca/2026/04/23/background-artificial-surfacing/>
- 67 California's Office of Environmental Health Hazard Assessment. California Environmental Protection Agency. (2026). <https://oehha.ca.gov/sites/default/files/media/2026-03/oehhatuffinal.pdf> <https://oehha.ca.gov/risk-assessment/report/release-final-report-synthetic-turf>
- 68 National Collaborating Centre for Environmental Health (2025). Artificial turf playing fields: A review of the evidence on health risks and environmental concerns. <https://nccch.ca/resources/evidence-reviews/artificial-turf-playing-fields-review-evidence-health-risks-and>
- 69 California's Office of Environmental Health Hazard Assessment. California Environmental Protection Agency. (2026). <https://oehha.ca.gov/sites/default/files/media/2026-03/oehhatuffinal.pdf> <https://oehha.ca.gov/risk-assessment/report/release-final-report-synthetic-turf>
- 70 de Haan, W.P., Quintana, R., Vilas, C., Cózar, A., Canals, M., Uviedo, O., Sanchez-Vidal, A. (2023). The dark side of artificial greening: Plastic turfs as widespread pollutants of aquatic environments, *Environmental Pollution*, Volume 334, 2023, 122094, ISSN 0269-7491, <https://doi.org/10.1016/j.envpol.2023.122094>. (<https://www.sciencedirect.com/science/article/pii/S0269749123010965>)
- 71 Toronto Public Health. (2015). Health Impact Assessment of the Use of Artificial Turf in Toronto. April 2015. City of Toronto. https://www.toronto.ca/wp-content/uploads/2017/11/9180-HIA_on_Artificial_Turf_Summary_Report_Final_2015-04-01.pdf
- 72 Moloney, K., Rodgers, T., Scholes, R. (2026). Artificial turf fields act as recurring point sources of metals and emerging tire-derived contaminants in stormwater. *Environmental Science: Processes & Impacts*. March 2026. <https://pubs.rsc.org/en/content/articlelanding/2026/em/d5em01016k>
- 73 de Haan, W.P., Quintana, R., Vilas, C., Cózar, A., Canals, M., Uviedo, O., Sanchez-Vidal, A. (2023). The dark side of artificial greening: Plastic turfs as widespread pollutants of aquatic environments, *Environmental Pollution*, Volume 334, 2023, 122094, ISSN 0269-7491, <https://doi.org/10.1016/j.envpol.2023.122094>. (<https://www.sciencedirect.com/science/article/pii/S0269749123010965>)
- 74 Savva, K., Llorca, M., Borrell, X., Bertran-Solà, O., Farré, M., & Moreno, T. (2024). Granulated rubber in playgrounds and sports fields: A potential source of atmospheric plastic-related contaminants and plastic additives after runoff events. *Journal of hazardous materials*, 479, 135697. <https://pubmed.ncbi.nlm.nih.gov/39216238/>
- 75 Thompson, R. C., Courtene-Jones, W., Boucher, J., Pahl, S., Raubenheimer, K., & Koelmans, A. A. (2024). Twenty years of microplastic pollution research—what have we learned?. *Science*, 386(6720), ead12746. <https://www.science.org/doi/10.1126/science.ad12746>
- 76 Bø, S.M., Bohne, R.A. & Lohne, J. (2024). Environmental impacts of artificial turf: a scoping review. *Int. J. Environ. Sci. Technol.* 21, 10205–10216. <https://doi.org/10.1007/s13762-024-05689-3> <https://link.springer.com/article/10.1007/s13762-024-05689-3#citeas>
- 77 de Haan, W.P., Quintana, R., Vilas, C., Cózar, A., Canals, M., Uviedo, O., Sanchez-Vidal, A. (2023). The dark side of artificial greening: Plastic turfs as widespread pollutants of aquatic environments, *Environmental Pollution*, Volume 334, 2023, 122094, ISSN 0269-7491, <https://doi.org/10.1016/j.envpol.2023.122094>. (<https://www.sciencedirect.com/science/article/pii/S0269749123010965>)
- 78 Norwegian Environment Agency. (n.d.). Miljødirektoratet. Plastic-containing infill material on artificial turf pitches. <https://www.miljodirektoratet.no/ansvarsomrader/avfall/avfallstyper/gummigranulat-fra-kunstgressbaner/> [accessed March 22nd, 2026] Norwegian Environment Agency (n.d.)
- 79 Collaborative for Health & Environment. (2026). Artificial Turf. Disposal Concerns. [accessed April 11th, 2026] <https://www.healthandenvironment.org/resources/environmental-hazards/chemicals-and-materials/artificial-turf-and-safer-alternatives>
- 80 Lanphear, B. (2025). Fake Grass. Real Poison. How synthetic turf became America's newest toxic waste crisis. [access April 11th, 2026] <https://blanphear.substack.com/p/toxic-turf-toxic-legacy>
- 81 Watterson A. (2017). Artificial Turf: Contested Terrains for Precautionary Public Health with Particular Reference to Europe? *Int J Environ Res Public Health*. 2017 Sep 12;14(9):1050. doi: 10.3390/ijerph14091050. PMID: 28895924; PMCID: PMC5615587. <https://pubmed.ncbi.nlm.nih.gov/articles/PMC5615587/>
- 82 National Collaborating Centre for Environmental Health (2025). Artificial turf playing fields: A review of the evidence on health risks and environmental concerns. <https://nccch.ca/resources/evidence-reviews/artificial-turf-playing-fields-review-evidence-health-risks-and>
- 83 Collaborative for Health & Environment. (2026). Artificial Turf and Safer Alternatives. [accessed April 11th, 2026] <https://www.healthandenvironment.org/resources/environmental-hazards/chemicals-and-materials/artificial-turf-and-safer-alternatives>
- 84 Toxics Use Reduction Institute (TURI). University of Massachusetts Lowell. (2021). Natural Grass Playing Fields: Selected Case Studies from Southwest Pennsylvania. <https://www.turi.org/publications/natural-grass-playing-fields-selected-case-studies-from-southwest-pennsylvania/>
- 85 Moore, R., Cosco, N. (2019). Early Childhood Outdoor Play and Learning Spaces (ECOPALS): Achieving Design Quality. In: Tremblay RE, Boivin M, Peters RDeV, eds. Brussoni M, topic ed. *Encyclopedia on Early Childhood Development* [online]. <https://www.child-encyclopedia.com/outdoor-play/according-experts/early-childhood-outdoor-play-and-learning-spaces-ecopals-achieving>. Published: May 2019. Accessed April 12, 2026.
- 86 McCuaig, K., Bertrand, J. (n.d.). Policy Oversight of Outdoor Play in Early Childhood Education Setting in Canadian Provinces and Territories. Ontario Institute for Studies in Education, University of Toronto. https://www.oise.utoronto.ca/home/sites/default/files/2023-10/policy_oversight_of_outdoor_play_in_early_childhood_education_setting_in_canadian_provinces_and_territories.pdf
- 87 Ramsden, R., Forer, B., Hussaina, H., Han, C., Bouchard, C., Crane, J., et al. (2026) Examining outdoor play associations in Canadian early learning and child care centres: Cross-sectional insights from the Measuring Early Childhood Outside Survey. *PLoS One* 21(2): e0331166. <https://doi.org/10.1371/journal.pone.0331166>
- 88 City of Vancouver. Childcare Design Guidelines. (1993. Last amended January 19, 2021) <https://guidelines.vancouver.ca/guidelines-childcare-design.pdf>
- 89 City of Toronto Child Care Design and Technical Guideline. (2016). Prepared by LGA Architectural Partners for Children's Services. City of Toronto. <https://www.toronto.ca/wp-content/uploads/2017/12/8641-CS-childcaredesign.pdf>

References *continued*

- 90 Kennedy, E., Olsen, H., Vanos, J., et al. (2021). Reimagining spaces where children play: developing guidance for thermally comfortable playgrounds in Canada. *Canadian Journal of Public Health*. *Revue Canadienne de Santé Publique*, 112(4), 706–713. <https://doi.org/10.17269/s41997-021-00522-7>
- 91 Vecellio, D., Vanos, J., Kennedy, E., Olsen, H., & Richardson, G. (2022). An Expert Assessment On Playspace Designs And Thermal Environments In A Canadian Context. *Faculty Publications*. 5302. <https://scholarworks.uni.edu/facpub/5302>
- 92 Government of Canada. (2025). Canada's National Framework for Environmental Learning. <https://www.canada.ca/en/services/environment/weather/climatechange/get-involved/advancing-literacy/national-framework.html>
- 93 Outdoor Play Canada. (2015). The Position Statement on Active Outdoor Play. <https://www.outdoorplaycanada.ca/resources/position-statement-on-active-outdoor-play/>
- 94 Tremblay, M., Gray, C., Babcock, S., Barnes, J., Bradstreet, C.C., Carr, D., Chabot, G., Choquette, L., Chorney, D., Collyer, C., Herrington, S., Janson, K., Janssen, I., Larouche, R., Pickett, W., Power, M., Sandseter, E.B., Simon, B., Brussoni, M. (2015). Position Statement on Active Outdoor Play. *Int J Environ Res Public Health*. 2015 Jun 8;12(6):6475-505. doi: 10.3390/ijerph120606475. PMID: 26062040; PMCID: PMC4483712. <https://pmc.ncbi.nlm.nih.gov/articles/PMC4483712/#ijerph-12-06475-s001>
- 95 Outdoor Play Canada. (2025). Position Statement on Active Outdoor Play. <https://www.outdoorplaycanada.ca/aop10/>, <https://www.outdoorplaycanada.ca/aop10-summary/>
- 96 Canadian Partnership for Children's Health and Environment. (2022). Healthy and Sustainable Child Care Environments – A Vision for Canada. https://healthyenvironmentforkids.ca/vision_child-care/
- 97 Canadian Public Health Association (CPHA). (2019). Children's Unstructured Play Position Statement. March 2019. Available at <https://www.cpha.ca/childrens-unstructured-play>.
- 98 Canadian Paediatric Society. (2024). Position Statement. Healthy childhood development through outdoor risky play: Navigating the balance with injury prevention. <https://cps.ca/en/documents/position/outdoor-risky-play>
- 99 Pan-Canadian Public Health Network. (2018). Active outdoor play statement from the Council of Chief Medical Officers of Health. <https://www.phn-rsp.ca/en/position-statements/active-outdoor-play-statement.html>
- 100 Lawson Foundation. (2020). Increasing Outdoor Play in Early Learning and Child Care in the Context of COVID-19. July 2020. English version available at <http://www.lawson.ca/op-elcc-covid19.pdf>. French version available at <http://www.lawson.ca/op-elcc-covid19-fr.pdf>.
- 101 The Children's Environmental Health Center. Icahn School of Medicine at Mount Sinai. Institute for Exposomic Research (2025). Position Statement on the Use of Artificial Turf Surfaces. <https://mountsinaiexposomics.org/position-statement-on-the-use-of-artificial-turf-surfaces/>
- 102 Olsen, H. (2025). Fundamentals for thermal comfort and safety: Designing climate-ready playgrounds. Retrieved from Standards Council of Canada <https://scc-ccn.ca/areas-work/climate-and-sustainability/urban-heat>
- 103 Canadian Standards Association (CSA Group) (2020). Children's playground equipment and surfacing (CSA 2614:20). Ontario, Canada: CSA Group <https://scc-ccn.ca/standards/notices-of-intent/csa-group/childrens-playground-equipment-and-surfacing-1>
- 104 Evergreen. (2024) Climate-Ready Schools Guide to child-friendly participatory design. <https://evergreen.ca/resource-hub/resources/a-climate-ready-schools-guide-to-child-friendly-participatory-design/>
- 105 GreenLearning. (2024). School Greening Simulator. GreenLearning's Flood:ED <https://programs.greenlearning.ca/course/schoolgreeningsim>
- 106 Canadian Public Health Association. (2021). Grade 6 Teacher's Kit – Building Awareness of Climate Sensitive Infectious Diseases in Canada. https://www.cpha.ca/sites/default/files/uploads/resources/idcc/2024_Teacher_Kit_EN.pdf
- 107 Evergreen. (2024). A Community Guide to Nature Play <https://evergreen.ca/resource-hub/resources/a-community-guide-to-nature-play/>
- 108 Child and Nature Alliance of Canada. Thrive Outside. [accessed April 12th, 2026] <https://childnature.ca/ece/> (Links to "Thrive Outside" resources including: A Teacher's Guidebook for Bringing Learning Outside, Supporting Children with Disabilities and Exceptionalities Outdoors, Risk Benefit Assessment for Outdoor Play: A Canadian Toolkit, Frequently Asked Questions about Outdoor Play and Learning, Health and Safety Tips for Managing Wildfire Smoke, and How to Pitch Outdoor Play and Learning in Schools).
- 109 Canadian Public Health Association. (2019). Unstructured Play Toolkit. [accessed April 5, 2026] <https://www.cpha.ca/unstructured-play>
- 110 Gill, T., Power, M., & Brussoni, M. (2019). Risk Benefit Assessment for Outdoor Play: A Canadian Toolkit. Ottawa: Child & Nature Alliance of Canada. <https://indd.adobe.com/view/44ed054b-917b-4e02-a1e3-e6c4cbfe0360>
- 111 BC Cancer Prevention. Provincial Health Services Authority. (2024). Shade Lookbook. https://www.bccancer.bc.ca/prevention/Documents/ShadeLookbook_May2024.pdf
- 112 Outside Play UBC Lab. (2024). Outside Play Toolkit. <https://www.outsideplay.org/#tool-kit>
- 113 Outdoor Play Canada (n.d.). Resource Library. [accessed April 10, 2026]. <https://www.outdoorplaycanada.ca/resources/>
- 114 Canadian Partnership for Children's Health and Environment (CPCHE) & Canadian Child Care Federation (CCCF). (2022). Creating Healthy and Sustainable Child Care Environments. Child Care Checklist and Resource Hub. <https://healthyenvironmentforkids.ca/child-care-resource/>
- 115 United States Environmental Protection Agency. (2025). Healthy School Environments. School Siting Guidelines [accessed April 13th, 2026] <https://www.epa.gov/schools/view-download-or-print-school-siting-guidelines>
- 116 Evergreen. Climate-Ready Schools. [accessed April 10th, 2026]. <https://www.evergreen.ca/projects/canadas-first-climate-ready-school/> <https://www.evergreen.ca/impacts/climate-ready-schools/>
- 117 BC Parks Foundation. (2026). Healthy by Nature. Learning by Nature. We're transforming schoolgrounds and empowering youth to learn about nature in nature. <https://www.healthybynature.ca/learning-by-nature>
- 118 BC Parks Foundation. (2026). School Ground Nature Parks. <https://www.healthybynature.ca/learning-by-nature-get-involved#sgnp>
- 119 Toronto and Region Conservation Authority. (2026). The Nature School. <https://trca.ca/learning/the-nature-school/>
- 120 Green Communities Canada. (2026). Depave Paradise. <https://depaveparadise.ca/>
- 121 Planting for Change (P4C). [accessed April 10th, 2026]. <https://www.acer-acre.ca/programs/planting-for-change-p4c>
- 122 Space to Grow, Greening Chicago Schoolyards. (2024) Healthy Schools Campaign and Openlands. [accessed April 10th, 2026]. <https://www.spacetogrowchicago.org/>
- 123 Canadian Partnership for Children's Health and Environment (CPCHE) & Pollution Probe. (2005). *Child Health and the Environment—A Primer*. <https://healthyenvironmentforkids.ca/2005/09/15/child-health-and-the-environment-a-primer/>
- 124 UNICEF. (2025). *Children face unique vulnerabilities to environmental hazards at every stage of life | Fragile beginnings*. <https://www.unicef.org/reports/children-face-unique-vulnerabilities-environmental-hazards-every-stage-life>
- 125 World Health Organization. (n.d.). *Children's environmental health*. World Health Organization. Retrieved February 18, 2026, from https://www.who.int/health-topics/children-environmental-health#tab=tab_2
- 126 Government of Canada. Draft Implementation Framework for the Right to a Healthy Environment under the Canadian Environmental Protection Act, 1999. <https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/publications/implementation-framework.html>
- 127 Child Care Now. 2025. Growth by Design: Expanding Early Learning and Child Care in Canada. Spotlight: Why physical environment matters in child care. <https://childcarenow.ca/2025/02/19/why-physical-environment-matters-in-child-care-spotlight-report/> https://childcarenow.ca/wp-content/uploads/sites/9/2025/05/Spotlight_3_Why-the-physical-environment-matters_EN-4_5.5.2025.pdf
- 128 Canadian Partnership for Children's Health and Environment. Healthy Environments for Learning Day (2025). A Collective Call for Action to Protect Childrens from Extreme Heat in Schools and Child Care Settings. <https://healthyenvironmentforkids.ca/wp-content/uploads/2025/04/HELD-Call-To-Action-2025-EN.pdf>
- 129 Herrington, S., & Nicholls, J. (2007). Outdoor play spaces in Canada: The safety dance of standards as policy. *Critical Social Policy*, 27(1), 128-138. <https://journals.sagepub.com/doi/10.1177/0261018307072210>
- 130 Canadian Partnership for Children's Health and Environment. (2025) FAQ: Traffic-Related Air Pollution. <https://healthyenvironmentforkids.ca/2025/07/29/traffic-related-air-pollution-trap/>
- 131 Sheikh HA, Maher BA, Woods AW, Tung PY, Harrison RJ. (2023). Efficacy of green infrastructure in reducing exposure to local, traffic-related sources of airborne particulate matter (PM). *Sci Total Environ*. 2023;903:166598. doi:10.1016/j.scitotenv.2023.166598
- 132 Akbari, E., & Vinet, I. (2022). Canada's child-care investment needs to advance climate change policy goals. *The Conversation*. July 24, 2022. <https://theconversation.com/canadas-child-care-investment-needs-to-advance-climate-change-policy-goals-185104>
- 133 Government of Canada. (2024) National Adaptation Strategy. [accessed April 10th, 2026]. <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/national-adaptation-strategy.html>
- 134 Government of Canada. (2024). Conserving 30% of Canada by 2030: Vision for the future. Commitments for nature. [accessed April 10th, 2026]. <https://www.canada.ca/en/services/environment/conservation/conserving-30-by-2030.html>