

Canadian  
kids need to  
move more  
to boost their  
brain health

**2018**

The ParticipACTION Report Card on  
Physical Activity for Children and Youth

# The 2018 ParticipACTION Report Card on Physical Activity for Children and Youth

**The 2018 ParticipACTION Report Card** on Physical Activity for Children and Youth is the most comprehensive assessment of child and youth physical activity in Canada. The Report Card synthesizes data from multiple sources, including the best available peer-reviewed research, to assign evidence-informed grades across 14 indicators. The Report Card has been replicated in over 50 cities, provinces and countries, where it has served as a blueprint for collecting and sharing knowledge about the physical activity of young people around the world.

ParticipACTION's strategic partner, the Healthy Active Living and Obesity Research Group at the Children's Hospital of Eastern Ontario Research Institute (HALO-CHEO), played a critical role in the research and development of the 2018 Report Card:



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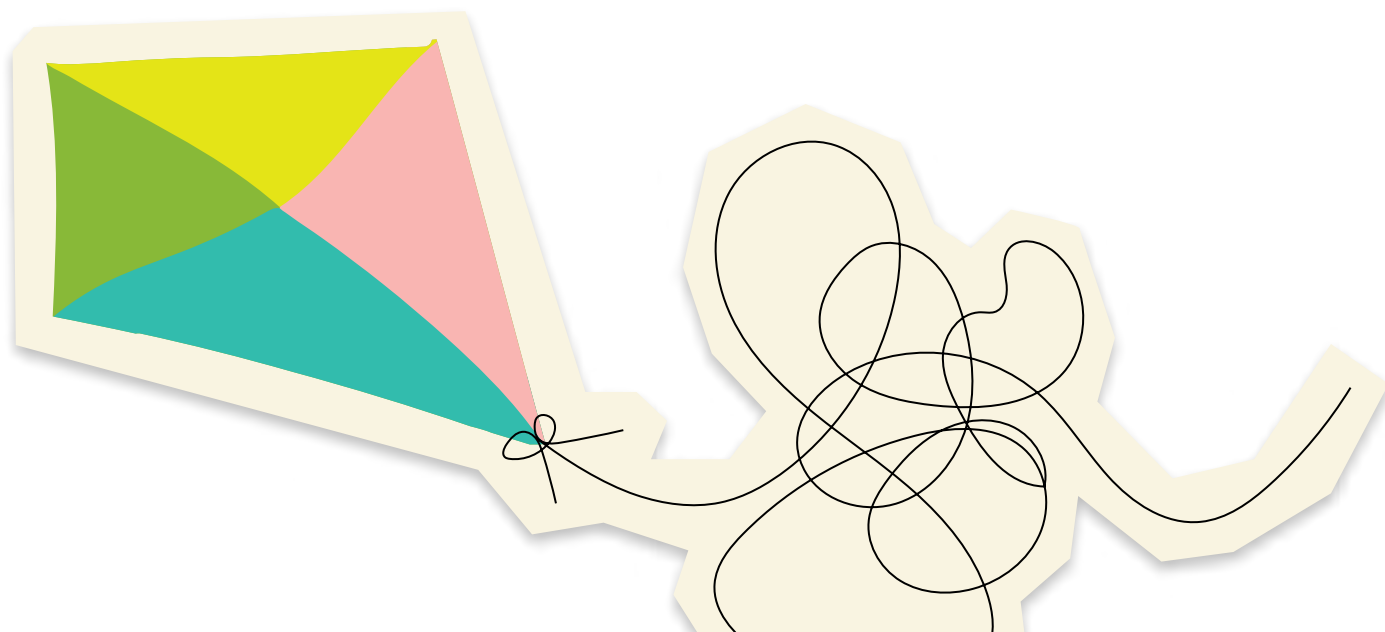
The 2018 Report Card and a summary of its findings (the Highlight Report) are available online at [www.participACTION.com/reportcard](http://www.participACTION.com/reportcard).

## **Help Us Do Our Job Better**

The Report Card is based on the best available physical activity data (primarily from the previous calendar year, and from earlier years where appropriate). If you have data that could inform future grades for one or more indicators, please contact ParticipACTION ([info@participaction.com](mailto:info@participaction.com)).

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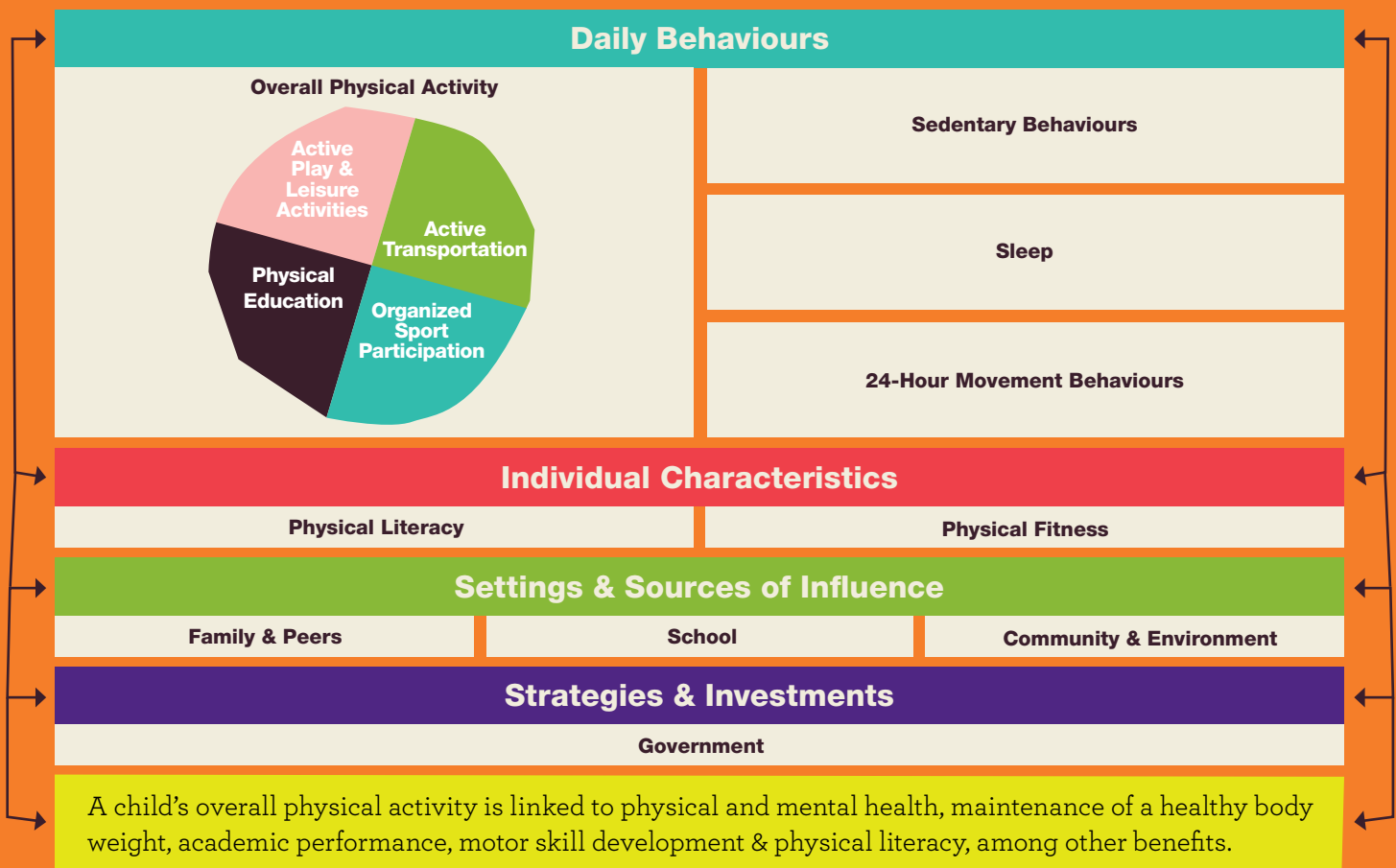
# Indicators & Grades

Grades are common to every report card. The 2018 Report Card assigns letter grades to 14 different indicators grouped into three categories (Figure 1): Strategies & Investments (Government), Settings & Sources of Influence (Family & Peers, School, Community & Environment), Daily Behaviours (Overall Physical Activity, Active Play & Leisure Activities, Active Transportation, Organized Sport Participation, Physical Education, Sedentary Behaviours, Sleep, 24-Hour Movement Behaviours) and Individual Characteristics (Physical Literacy, Physical Fitness). Letter grades are based on an examination of current data for each indicator against a benchmark(s). Together, the indicators provide a complete and robust assessment of how we are doing as a country regarding the promotion and facilitation of physical activity among Canadian children and youth.

## *New Approach to Assigning Letter Grades in the Report Card*

When assigning grades, the Report Card Research Committee (RCRC) has to consider multiple key findings that apply to children and youth of varying age groups. A typical scenario involves the RCRC having to consider key findings from three age groups: preschoolers (3- to 4-year-olds), young children (5- to 11-year-olds) and youth (12- to 17-year-olds). Each group represents a different proportion of the overall age range (3 to 17 years) included in the Report Card. Preschoolers represent two (age 3-4) of the 15 years in the overall age range; children represent seven (age 5-11) of the 15 years in the overall age range; and youth represent the remaining six (age 12-17) of the 15 years in the overall age range. These numbers can then be converted to percentages that sum to 100%: 13%, 47% and 40% respectively.

**Figure 1.** Summary of the 2018 Report Card indicators.



In this year's Report Card, a new approach to assigning indicator grades is being implemented that involves applying these percentages (weightings) to the key findings in order to provide a more fair and valid representation of the overall proportion of children and youth meeting a given age-specific benchmark.

### Example from the Overall Physical Activity indicator:

#### Overall % meeting the benchmark

$$\begin{aligned} &= (\text{preschool weight} \times \text{preschool key finding}) + \\ & \quad (\text{child weight} \times \text{child key finding}) + \\ & \quad (\text{youth weight} \times \text{youth key finding}) \\ &= (13\% \times 62\%) + (47\% \times 35\%) + (40\% \times 35\%) \\ &= 39\% \end{aligned}$$

This is important because how the key findings are weighted can have considerable impact on the eventual letter grade for an indicator. For example, if a simple average had been calculated from the two key findings above ( $[62\% + 35\%] / 2 = 49\%$ ), the overall proportion meeting the benchmark would have been 49% and a grade of C would have been assigned instead of a D+. This new approach provides a more fair and valid approach to the grading process.

## Why is Physical Activity Important?

Every Report Card takes into account the hundreds – if not thousands – of new research studies published that continue to establish and explore more deeply the conclusive link between physical activity and health in the pediatric population. The array of health benefits associated with physical activity in children and youth (5- to 17-year-olds) is truly extensive. Available evidence suggests that

higher levels of physical activity are associated with more favourable measures of: physical fitness<sup>1,2</sup> (e.g., vertical jump, sit-and-reach, waist circumference, grip strength, predicted maximal oxygen consumption, push-ups, partial curl-ups, overall fitness), motor competence<sup>3</sup> (i.e., the skill, coordination and control that underlies a given physical activity task), weight status<sup>1,4,5</sup> (e.g., lower body mass index, waist circumference), metabolic health<sup>5,6,7</sup> (e.g., blood pressure, blood glucose, insulin, triglycerides), arterial characteristics<sup>8</sup> (i.e., measures of artery wall structure and function such as artery wall thickness, artery diameter, etc.), bone health<sup>9</sup> (e.g., bone mineral content and density), academic achievement<sup>10,11,12,13,14,15,16,17</sup> (e.g., math, reading and writing scores on standardized tests), health-related quality of life<sup>18,19</sup> (indicator of physical, mental, emotional and social functioning), brain and mental health<sup>20,21,22,23,24</sup> (e.g., cognitive functioning, self-esteem, anxiety, depression), and the list goes on. In view of this, it is hardly surprising that when physical activity, sedentary behaviour and sleep are considered as the three parts that make up a 24-hour day, it is physical activity – particularly moderate- to vigorous-intensity physical activity (MVPA) – that is most consistently linked to health.<sup>5</sup>

The health benefits of physical activity are also seen in the early years (0- to 4-year-olds). A recent systematic review of nearly 100 research studies from 36 countries found that physical activity – MVPA and total daily physical activity – is associated with improved motor development (e.g., running, jumping, hopping), cognitive development (e.g., language development, executive functioning, attention), psychosocial health (e.g., self-esteem, pro-social behaviour, aggression) and cardiometabolic health (e.g., blood pressure, insulin resistance).<sup>25</sup> In observational studies, physical activity is positively associated with favourable motor development, physical fitness (e.g., cardiorespiratory fitness) and bone/skeletal health (e.g., bone mineral density).<sup>25</sup> The link also exists between physical activity and more favourable body composition indicators (e.g., overweight, obesity, body mass index); however, the relationship is not as consistent in the early years as it is in older age groups.<sup>25</sup>

# The Science Is In

## KIDS + STEPS + SWEAT = HEALTHIER BRAINS

**All kids deserve** to thrive in mind and body. But in order for them to reach their full mental, emotional and intellectual potential, we have to foster the important connection between the health of the body and of the brain. Their bodies have to move to get the wheels in their brains turning. Kids need to be active. Their brain health depends on it. It's time for them to drop the phones, get off the couch and break a sweat – now more than ever.

For decades we've known that physical activity improves heart health, helps maintain healthy body weights and builds strong bones and muscles in kids across a range of skills and abilities. But we may have been overlooking what physical activity does for one of their most vital and complex organs: **the brain.**

A growing body of evidence indicates that physical activity in childhood is essential for a healthy brain and leads to improved:

- thinking and learning
- emotional regulation and self-control
- problem-solving ability
- memory
- brain plasticity – the growth of new brain tissue
- stress management
- ability to cope with anxiety and depressive symptoms
- self-esteem and self-worth
- attention and focus

**While 62% of 3- to 4-year-olds are reaching their recommended physical activity levels as outlined in the Canadian 24-Hour Movement Guidelines for the Early Years, only 35% of 5- to 17-year-olds are achieving the recommended activity levels for their age group. We also know that 76% of 3- to 4-year-olds and 51% of 5- to 17-year-olds are engaging in more screen time than is recommended by the Canadian Guidelines for screen-based sedentary behaviours.**

**Canadian kids are sitting too much and moving too little to reach their full potential.**



## + Adding more physical activity to kids' routines could be the missing part of the equation in support of their success in the classroom, on the field and with their friends.

### Moving > Cramming

- Students who exercise before a test show stronger brain function than those who don't.<sup>26</sup> So, next time students feel the pressure to cram, encourage them to take an active break from studying: some heart-pumping physical activity may actually be the smarter study technique.
- When the body doesn't move enough, the brain can't perform to its fullest potential. Children with poor aerobic fitness appear to have more difficulty solving problems<sup>27,28,29</sup> and are more likely to make mistakes when trying to sort out a challenge.<sup>30</sup>

### Busy Bodies = Bigger Brains

- Sections of the brain dedicated to memory and learning (hippocampus and basal ganglia) are larger in active children in comparison to their less active peers.<sup>31</sup>
- Being physically active can boost memory in children and youth,<sup>32,33</sup> including those with some brain-based disabilities (e.g., attention deficit hyperactivity disorder, autism spectrum disorder, cerebral palsy).<sup>34,35,36,37</sup>

### Active Bodies = ↑ Innovative Ideas

- Active kids are better equipped to get creative.<sup>30</sup>
- Even if they aren't artistic, creativity can manifest in think-on-your-feet scenarios such as strategizing for a game, leading a team project or solving a math problem. Without adequate physical activity, it's difficult for kids to tap into their full potential!

### Zooming Around Helps Them Zoom In!

- Kids who participate in physical activity have more focus and longer attention spans, compared to their less active peers.<sup>32,33</sup>
- This correlation appears to be consistent for all children and youth, including those with attention deficit hyperactivity disorder and autism spectrum disorder.<sup>38</sup>





## + Boosting kids' physical activity levels could be the missing part of the equation in supporting their mental health.

### Breaking a Sweat Releases Happy Hormones ∴ Kids Who Move Feel Great!

- ☀ Just like adults who love that “runner’s high” from going the distance, kids who are active experience the same rush of feel-good brain chemicals (serotonin and dopamine).<sup>37</sup>
- ☀ Children and youth who are fit benefit from this rush of chemicals and experience fewer depression-related symptoms than those who are not fit.<sup>35,36</sup>
- ☀ Kids with brain-based disabilities are at an increased risk for mental health problems, so they have even more to gain from getting, and staying, active.<sup>31</sup>

### ↑ Movement = ↓ Symptoms of Anxiety

- ☀ Evidence suggests that physical activity may help lower feelings of anxiety in children and youth.<sup>39,40</sup> Dance and team sports may be especially effective in children and youth with brain-based disabilities.<sup>41,42</sup>
- ☀ Canadian kids are on the right track here, with **77% of 5- to 19-year-olds**<sup>2014-16 CANPLAY</sup> and **46% of 3- to 4-year-olds**<sup>2012-13 and 2014-15 CHMS</sup> **participating in organized physical activities or sport.**

### ↑ Movement = ↓ Stress

- ☀ Research suggests that physical activity is an effective tool in alleviating social and academic stress in young people; those kids who are less active have measurably higher levels of the stress hormone cortisol in their bodies.<sup>43</sup>
- ☀ Moreover, being active not only appears to bolster kids’ resiliency when they are dealing with stress, but it appears to help them recover from stressful situations faster.<sup>43</sup>
- ☀ Being active outdoors, even for a simple walk, is a powerful antidote for adolescents facing stress.<sup>44</sup> But with **only 37% of 11- to 15-year-olds in Canada playing outdoors for more than 2 hours per day (outside of school hours)**<sup>2013-14 HBSC</sup> we have a long way to go to ensure they are reaping these mental health benefits.

### ↑ Movement = ↑ Self-esteem

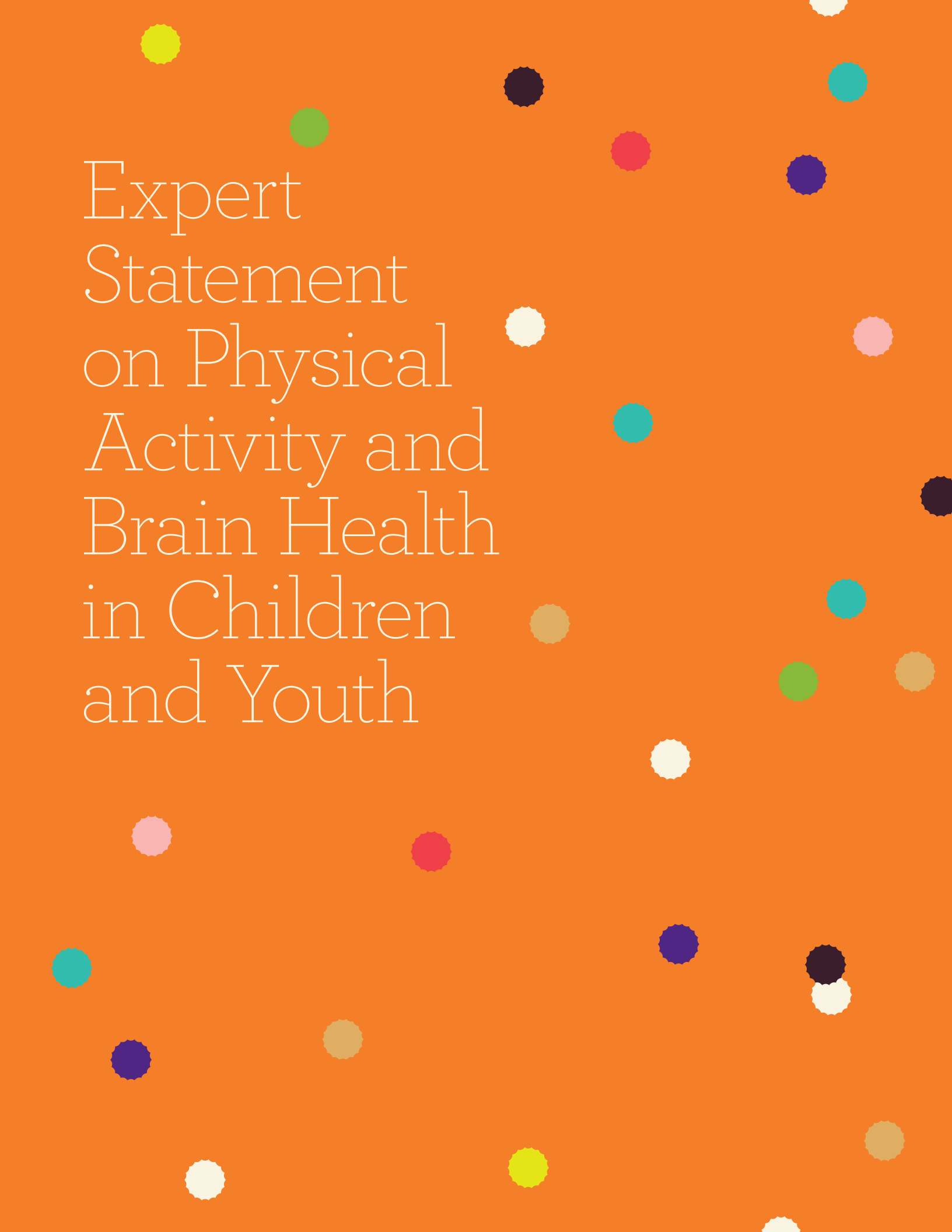
- ☀ Social media plays a major role in self-esteem for many young people. Kids are subjected to never-ending online scrutiny from their peers. Getting active can be a protective tool to bolster kids’ self-esteem, confidence and self-worth.<sup>20</sup>

- ☀ Real-world physical activity can distract them from these virtual experiences that could erode how they perceive themselves.<sup>45</sup>
- ☀ When children and youth get active, research shows that they have improved self-esteem, which in turn leads to better moods and an overall more positive sense of satisfaction with how they perceive themselves.<sup>46,47,48,49,50,51</sup> Yet, **5- to 11-year-olds and 12- to 17-year-olds in Canada spend 2.3 and 4.1 hours per day, respectively, in recreational screen time pursuits**,<sup>2014-15 CHMS</sup> leaving little time for offline, active movement.

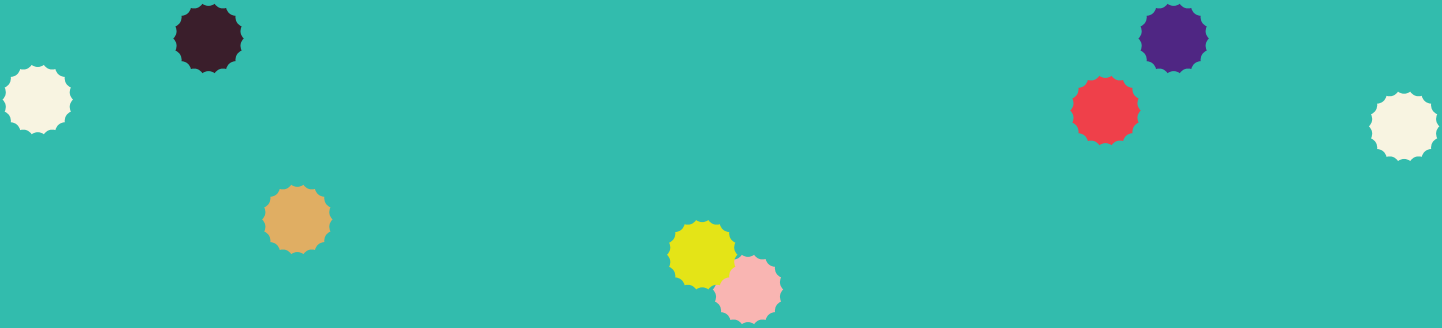
We all want to see Canadian kids realize their potential physically, emotionally and cognitively. A healthy brain is one of their greatest resources – today and into the future. Engaging kids in daily physical activity may be the most accessible, but underutilized, way to support them on this journey. Let’s work to balance the equation.

# The Science Is In

**KIDS + STEPS + SWEAT =  
HEALTHIER BRAINS**



Expert  
Statement  
on Physical  
Activity and  
Brain Health  
in Children  
and Youth



For better brain health,  
*all* children and youth  
should be physically  
active on a regular basis.  
In addition to physical  
health benefits, physical  
activity also improves  
cognition, brain function  
and mental health.



## BACKGROUND

**A team of experts** in paediatric neuroscience and exercise science created this *Expert Statement*, looking at the relationship between **physical activity** and **brain health** in children and youth. The best available scientific evidence was used to inform the development of this report, and an expert advisory group provided feedback on its messaging. All members of the expert team approved this *Expert Statement*.

While the physical health benefits of childhood physical activity are well known (e.g., improved heart, bone and muscle health; prevention of type 2 diabetes),<sup>1,2,3</sup> a growing body of research has begun to examine the benefits of childhood physical activity in relation to brain health. Emerging evidence suggests that physical activity in childhood and adolescence is associated with better **cognition** (i.e., thinking and learning), **brain function** (i.e., how the brain works) and **mental health** (i.e., emotional, psychological and social well-being).

**The landscape of preventable chronic disease among children and youth is changing—and not for the better.** The prevalence of overweight and obesity,<sup>4</sup> diabetes,<sup>5</sup> and use of health services for mental illness<sup>6</sup> is high. These issues are more prominent in children and youth with **neurodevelopmental (brain-based) disabilities**,<sup>7</sup> where physical activity participation can be challenging, and social inclusion is limited<sup>8,9,10</sup> due to the initial diagnosis, inaccessible facilities, and financial constraints. Further, there is a lack of appropriate and modified equipment, as well as few professionals who are prepared or trained to promote physical activity among children and youth with brain-based disabilities.<sup>11,12,13</sup> The majority of research in this population has focused on children and youth with Down syndrome and autism spectrum disorder;

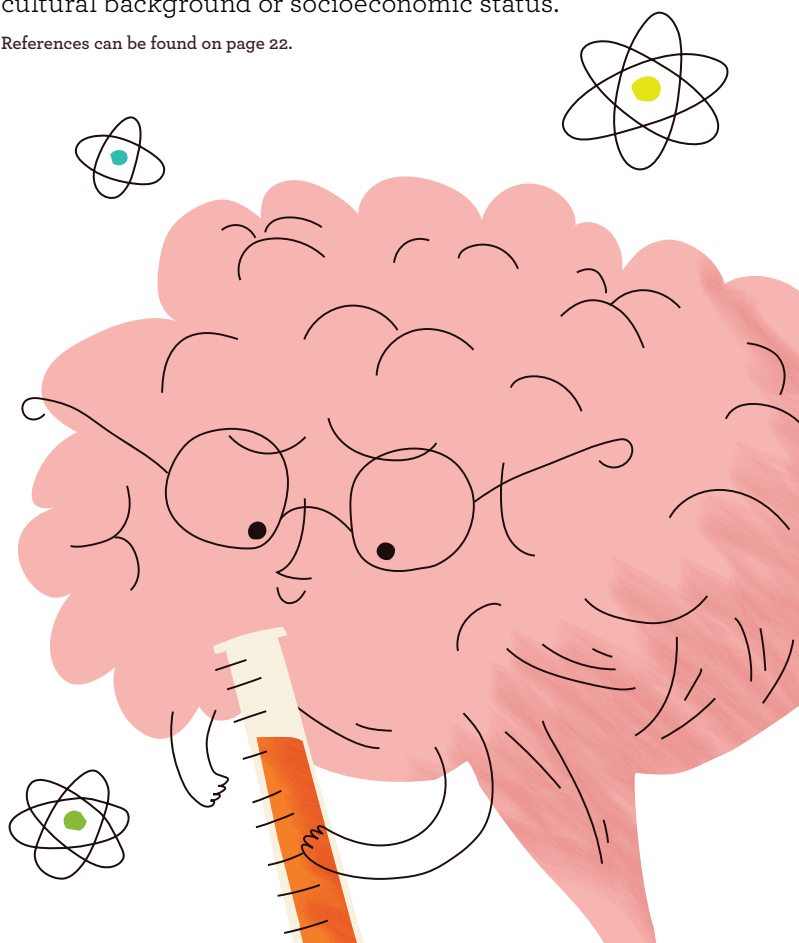
however, based on the evidence, it is anticipated that all children and youth, regardless of disability type, will benefit from physical activity.

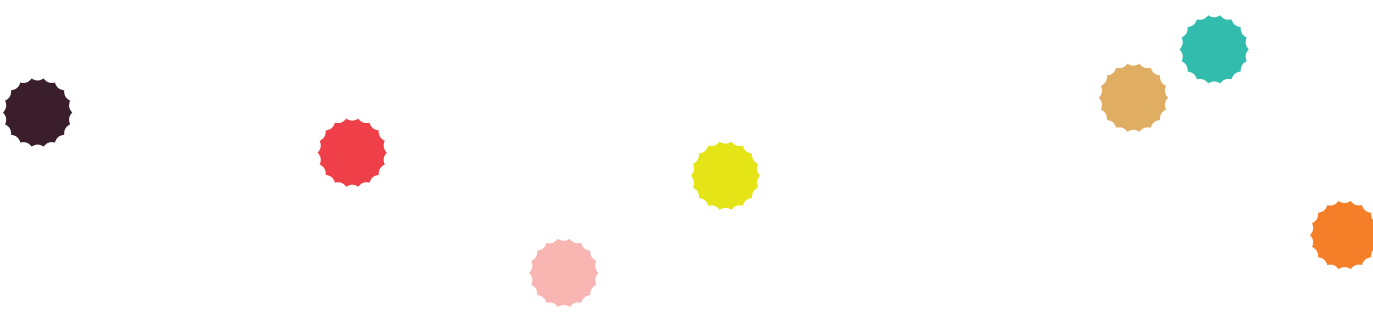
### **Is inactive modern living hindering our children's ability to develop optimally and perform well in all aspects of life?**

Have we created physical and social environments that no longer promote physical activity to the point that they are negatively impacting the brain health of our children and youth? This is something that society—parents, governments, healthcare professionals, non-profits—should seriously consider.

This *Expert Statement* applies to all children and youth (under 18 years), including those with brain-based disabilities, regardless of sex, cultural background or socioeconomic status.

References can be found on page 22.





# How Does Physical Activity Help The Brain? The Evidence

## COGNITION, BRAIN FUNCTION AND BRAIN STRUCTURE

Physical activity is broadly beneficial to how the brain controls thoughts and behaviours, and even how the brain is structured. These brain benefits occur after short bouts of physical activity and become more apparent with regular physical activity.

### Improved cognition and behaviour

Participation in regular physical activity improves the ability of children and youth to meet academic expectations, with greater physical activity levels leading to better performance in subjects such as mathematics, reading/language, science and social studies.<sup>14</sup> Active children and youth are better able to pay attention<sup>15</sup> and to focus and concentrate on a given task for a longer period of time.<sup>16</sup> This also appears to be true for children and youth with attention deficit hyperactivity disorder (ADHD)<sup>17,18</sup> or autism spectrum disorder,<sup>19</sup> with even a single bout of physical activity improving attention and focus.<sup>17,20</sup> Physical activity has also been shown to be associated with better memory,<sup>21</sup> both in typically developing children and youth and in children with ADHD.<sup>22,23,24,25</sup>


Physical activity also helps with **convergent** and **divergent thinking**,<sup>26</sup> leading to improvements in creative problem-solving and decision making.<sup>27</sup> Also, physical activity seems to beneficially impact the cognitive aspects involved with behaviour regulation,

known as **executive function**.<sup>24,28,29,30,31,32</sup> Less active children and youth seem to have more difficulty than active children and youth in performing challenging and demanding tasks,<sup>33,34,35,36,37,38</sup> and are also more likely to make more mistakes on these tasks.<sup>39</sup> It seems that children and youth who are less active or who have brain-based disabilities (such as autism spectrum disorder<sup>40</sup>) experience the greatest benefits in executive function as a result of physical activity.<sup>17,34</sup>

A primary goal for children and youth with brain-based disabilities is participation in regular physical activity. Physical activity has the potential to build the basic foundations to better communicate, socialize, increase self-control and maintain focus—leading to a healthier, higher **quality of life**.<sup>41</sup>

### Enhanced brain function and structure

Research suggests that physical activity can change the structure and function of the brain. Children and youth who are physically active have larger brain volumes in the areas involved with memory and executive functions, including the hippocampus (deals with memory and emotions)<sup>42</sup> and basal ganglia (deals with routine/voluntary motor movements).<sup>43</sup> Physical activity can positively affect the amount of grey matter (i.e., the “living brain”)<sup>44</sup> as well as support better communication between grey and white matter (i.e., tissue that connects different parts of grey matter to each other).<sup>45,46,47</sup> Active children and youth are also better able to “switch on” the brain regions responsible for high-level thinking.<sup>35,48</sup> Markers of brain health appear to be sensitive to both single and repeated bouts of physical activity participation, with physical activity resulting in greater attention, motor skills and self-regulation.<sup>16,33,48,49,50,51</sup>

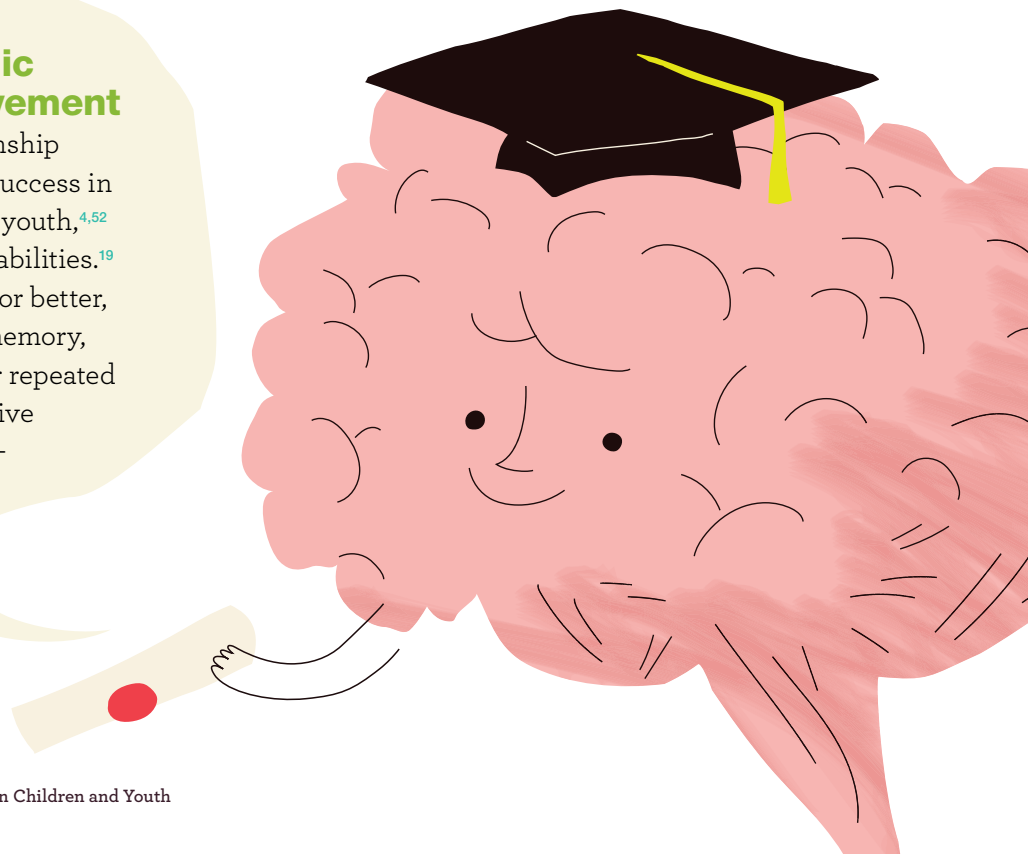


The current state of evidence highlights favourable relationships between physical activity and cognition. Many studies support a positive relationship between physical activity and brain function and structure.

Physical activity plays an important role in helping children and youth learn better, solve problems more creatively, and develop healthier brains. Children and youth who are least active or who have brain-based disabilities may have the most to gain.

### **A Tool for Academic and Scholastic Achievement**

Research suggests a positive relationship between physical activity and school success in both typically developing children and youth,<sup>4,52</sup> as well as children with brain-based disabilities.<sup>19</sup> Many of the brain processes that make for better, more efficient learners—such as focus, memory, and recall—are enhanced after single or repeated bouts of physical activity. Overall, active children and youth make for better-achieving students.<sup>53</sup>





## MENTAL HEALTH

Physical activity can help support mental health and wellness among children and youth. It can help manage and prevent negative symptoms from occurring in the first place, and also promote positive emotions and self-esteem.

### Reduction in symptoms of depression

Physical activity helps minimize **depressive symptoms** in children and youth.<sup>54,55,56,57,58,59,60</sup>

Perceptions of control and the social nature of physical activity are two of the most understood reasons for how physical activity contributes to reduced depressive symptoms in children and youth. Additionally, research suggests that the rush in serotonin and dopamine—**neurotransmitters** or “feel-good” brain chemicals that are released while being physically active—may also play a role in promoting feelings of happiness in children and youth.<sup>61</sup> Of note, children and youth with brain-based disabilities are at an increased risk for mental health problems,<sup>62</sup> and potentially have more to gain from participating in physical activity. Long-term participation in physical activity may help with neurotransmitter release and improve emotional health.<sup>63</sup>

While much of the published work highlights the effectiveness of physical activity in reducing depression,<sup>57,69</sup> more evidence is needed to examine the impact of physical activity in preventing depression in children and youth.

### Social Inclusion and Children with Disabilities

Children and youth with disabilities are less active.<sup>64</sup> Physical activity helps improve social integration which is a major challenge noted among children with brain-based disabilities.<sup>8,9,10,30,65,66</sup> Physical activity provides opportunities for these children to enhance their interaction and communication skills,<sup>67,68</sup> resulting in improved daily functions, health-related outcomes and quality of life.<sup>41</sup>



### Decreased feelings of anxiety

Though limited, preliminary evidence suggests that physical activity may play a role in the prevention and management of feelings of **anxiety** in children and youth,<sup>56,69</sup> including children and youth with brain-based disabilities, such as ADHD and autism spectrum disorder.<sup>70</sup> Activities such as dance and team sports have specifically been highlighted in the literature as reducing feelings of anxiety in children and youth with brain-based disabilities.<sup>19,30</sup> Physical activity can also serve as a short-term distraction from the anxious symptoms experienced by children and youth.<sup>71</sup>

### Improved stress response

Although the mechanisms are largely unknown, higher levels of physical activity in children and youth are associated with lower stress and reduced **stress reactivity** (i.e., the body’s reaction to stress).<sup>72,73</sup> Children and youth who have high levels of stress tend to spend more time being sedentary. In contrast, children and youth who participate in various types of physical activity seem to cope better with stress and display better resilience.<sup>73,74</sup> The teenage years are a particularly vulnerable time of development, as various regions of the brain are undergoing many changes, which are negatively affected by stress. Fortunately, physical activity may improve these stress-induced changes.<sup>75</sup>

### Enhanced self-esteem, self-concept and self-perception

Children and youth who engage in regular physical activity report better perceptions of themselves, including having higher **self-esteem**.<sup>69,76,77,78,79,80,81</sup> Regular physical activity is associated with increased **self-concept** and **self-worth** in typically developing children and youth<sup>76,77,78,79,80,82</sup> and in children with brain-based disabilities.<sup>83,84,85</sup> Increased self-esteem can, in turn, promote better moods, increase life satisfaction lessen symptoms related to anxiety and depression and shield children from the negative impacts of stress.



Collectively, the research indicates that physical activity plays a key role in preventing and reducing symptoms of depression and anxiety, in helping with stress management and in improving self-esteem in children and youth. Although initial evidence is promising, additional work is needed to clarify and confirm the relationship between physical activity and mental health in children and youth with brain-based disabilities.

Overall, when it comes to mental health, physical activity can help children and youth who are experiencing low moods or stress, and can also provide benefits for all children and youth by helping them better manage stress and by promoting positive emotions. Physical activity supports and encourages mental and emotional wellness, with very little evidence suggesting harmful effects.

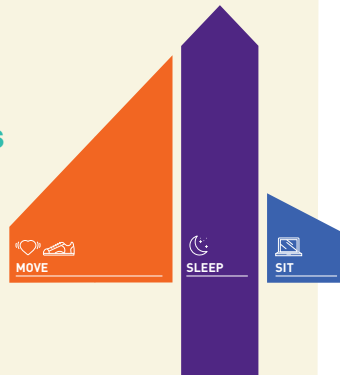


## CANADIAN 24-HOUR MOVEMENT GUIDELINES

### Physical Activity Recommendations

#### Under 1 Year

Being physically active several times daily in a variety of ways, particularly through interactive floor-based play—more is better. For those not yet mobile, this includes at least 30 minutes of tummy time spread throughout the day while awake.



#### 1–2 Years

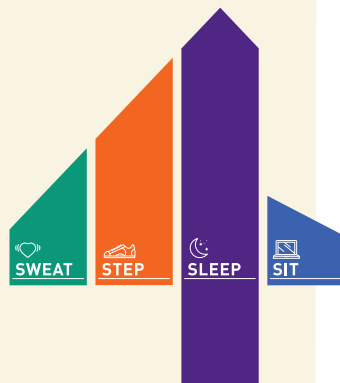
At least 180 minutes spent in a variety of physical activities at any intensity, including energetic play, spread throughout the day—more is better.

#### 3–4 Years

At least 180 minutes spent in a variety of physical activities spread throughout the day, of which at least 60 minutes is energetic play—more is better.

#### 5–17 Years

An accumulation of at least 60 minutes per day of moderate to vigorous physical activity involving a variety of aerobic activities. Vigorous physical activities, and muscle- and bone-strengthening activities, should each be incorporated at least 3 days per week.



[csepguidelines.ca](http://csepguidelines.ca)  
[BuildYourBestDay.com](http://BuildYourBestDay.com)

## Physical Activity Recommendations for Brain Health

For healthy brain development, children and youth should be encouraged to participate in at least the daily minimum of physical activity recommended by the Canadian 24-Hour Movement Guidelines.<sup>17,34,86,87</sup> However, some physical activity is better than none.

The benefits of physical activity can also build over time.<sup>88</sup> While some of the effects of physical activity are immediate, participation in regular physical activity supports long-term brain development and better mental health. In addition to immediately improving self-esteem, creativity and concentration, regular physical activity can increase **neuroplasticity** in children and youth,<sup>89</sup> creating new pathways in their brains and supporting better learning.<sup>14,17,21,44,70</sup> It also improves brain blood flow, which increases the amount of oxygen flowing to the brain, and releases **neurotrophins** and neurotransmitters that support better brain function.<sup>61,63,90,91</sup>

Children and youth with brain-based disabilities should be encouraged to engage in daily physical activity for improved brain health. With the prior approval of their healthcare provider, children and youth with brain-based disabilities should be encouraged to engage in a variety of activities at various intensities that are fun for them and appropriate for their skill-level and abilities. Supportive, accepting and modified environments, developmentally appropriate equipment, and trained coaching staff are essential.<sup>92</sup> Most importantly, promoting daily physical activity among children and youth with brain-based disabilities will help foster feelings of happiness and mental wellness,<sup>92,93,94</sup> as well as improve executive function.<sup>22,23,24,29,30,31,96,97,98,99,100</sup> Physical activity can also improve sleep, a particular benefit to children and youth with brain-based disabilities, who often experience sleep problems that can greatly hinder their quality of life.<sup>101,102</sup>



## Tips to Promote Brain Health

### Parents and families

- Encourage children and youth to meet the daily physical activity guidelines for their age, and support them in their efforts.
- Promote age-appropriate outdoor play as a way of improving decision making, problem-solving and self-confidence.
- Become aware of sport and physical activities that are appropriate for the skill level and abilities of children and youth.
- Learn about funding opportunities for participation in sports and recreation activities by children and youth.
- Explain the child's strengths and needs to local physical activity and recreation providers so the instructors have the knowledge required to ensure an inclusive environment/experience.
- Be active as a family. This encourages physical activity, togetherness, social support and connectedness, which are all important for good mental health.
- Seek out quality programming with trained instructors that support **physical literacy**.

### Healthcare professionals

- Recommend children and youth meet the Canadian physical activity guidelines to promote good brain health.
- Recommend and/or “prescribe” physical activity to complement the prescribed medical course of treatment for anxiety, depression and focus-related conditions (such as ADHD) among children and youth.<sup>103</sup>
- Be familiar with community-based inclusive programming (e.g., Special Olympics, ParaSport programs, disability-specific sporting organizations).
- Share information with community physical activity and recreation providers to help them better support children and youth with brain-based disabilities.
- Assist families with funding requests for specialized adapted sports equipment if required for independent participation.



### Educators

- Provide daily opportunities for physical activity and active play during school and childcare hours.
- Include active learning strategies in daily school curriculum and childcare programming.
- Interrupt long periods of sitting with active breaks.
- Educate children, youth and families that regular physical activity is good for the brain as well as the body.
- Avoid using the removal of opportunities for physical activity and outdoor play as punishment.
- Be informed about adaptations/modifications to physical education curriculum (e.g., FUNdamentals through Special Olympics, Canadian Paralympics Committee FUNdamental resource, ParaSport education and awareness opportunities) to increase inclusivity and participation.
- Personalize physical activity programs for children and youth with brain-based disabilities using a strength-based approach.

### Recreation, coaching and community representatives

- Support the availability of specially trained staff and settings that facilitate physical activity for all children and youth, including those with disabilities.
- Encourage the development of inclusive and universally designed play opportunities, resources and spaces.
- Provide personalized, accepting and respectful play environments for all children and youth, including children with brain-based disabilities.
- Foster the growth and development of specialized and inclusive programming.
- Seek funding opportunities to support the development of inclusive and accessible programming for children and youth with disabilities.
- Provide programming during optimal timeslots for parents and their children and youth with disabilities.
- Create positive awareness and introductory events to introduce children and youth to available programming.
- Communicate with families and community members to ensure they are aware that children and youth with brain-based disabilities are welcome to participate in programs.
- Ensure instructors and coaches are trained in promoting physical literacy and strength-based programming.



## Government officials

- Recognize physical activity as both a physical, cognitive and mental health promotion strategy at a population level.
- Continue to legislate and create policies that encourage and/or mandate physical activity during school and childcare hours.
- Provide additional funding and subsidies for low-income families as well as families with children and youth with disabilities, to help decrease barriers to participation.
- Recognize the need for, and provide additional funding for, specialized staff training and increased programming options/resources (e.g., community organizations, healthcare facilities).
- Provide training opportunities for educators about active learning strategies.
- Allocate additional granting opportunities to service providers to increase inclusion and accessibility.
- Provide increased funding for inclusive indoor and outdoor play spaces and equipment.
- Support awareness and education campaigns about the benefits of physical activity for child and youth brain health across all levels of abilities.

## Research Gaps and Future Directions

- More studies are needed to look at the long-term effects of physical activity on child and youth brain development.
- More investigations are needed to understand the amount and intensity of physical activity needed to improve and support positive brain health.
- More research examining the impact of physical activity on the mental health outcomes of children and youth with brain-based disabilities is needed.
- A more focused look at the relationship between physical activity and brain health across all disability categories is necessary.
- Further investigations into the development of physical literacy for long-term physical activity and its impact on brain health (especially cognitive function) are needed.
- Increased research is needed to understand the impact of physical activity on depression, anxiety, stress and stress reactivity.
- Additional research is needed to explore the impact of physical activity on social inclusion for children and youth with and without brain-based disabilities. This is especially important given that peer relationships become increasingly important from childhood to adolescence.<sup>104</sup>
- More information is needed on the types of physical activities (e.g., individual activities, group activities, indoor/outdoor activities, activities with therapy animals, water-based activities) that are associated with the greatest benefits in children and youth with and without brain-based disabilities.
- More research is needed to explore the impact of physical activity on brain health in younger children (under 6 years).
- More research is needed to explore how physical activity and sport experiences should be structured and delivered to more reliably promote positive mental health outcomes in children and youth.
- More collaborations are required with end/knowledge users and front-line staff to bring research to practice, and practice to research (e.g., evidence-based programs, clinician training).

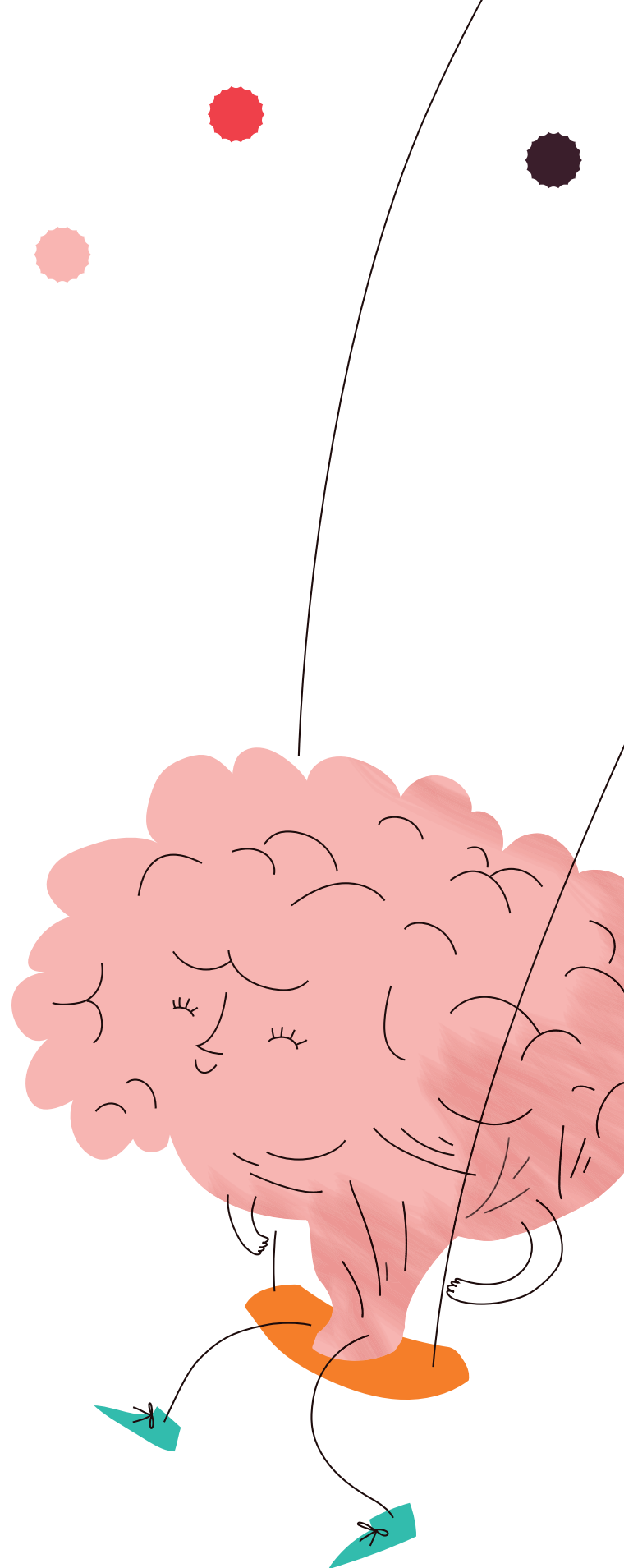
## Our Expert Panel

- Dr. Mark S. Tremblay (Chair), Children’s Hospital of Eastern Ontario Research Institute
- Dr. Leigh M. Vanderloo (Co-Chair), ParticipACTION and The Hospital for Sick Children
- Dr. John Cairney, University of Toronto
- Louise Choquette, Best Start Resource Centre
- Dr. Jean-Paul Collet, Kids Brain Health Network
- Tom Davies, Special Olympics Canada
- Dr. Guy Faulkner, University of British Columbia
- Dr. Mojgan Gitimoghaddam, University of British Columbia
- Emily Glossop, Abilities Centre Ottawa
- Dr. Dan Goldowitz, Kids Brain Health Network
- Dr. Katie Gunnell, Carleton University
- Saskia Kwan, Ontario Brain Institute
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## Our Partners and Funders




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# GLOSSARY OF KEY TERMS

Term	Definition / Description
<b>Anxiety</b>	Excessive worry (about school, friends, work, etc.) occurring more days than not, for at least 6 months. <sup>105</sup>
<b>Brain function</b>	How the brain works, and the processes and behaviours it controls.
<b>Cognition</b>	The mental action of acquiring knowledge and understanding (i.e., thinking and learning).
<b>Convergent thinking</b>	The ability to solve standard problems with a single, correct answer.
<b>Depression</b>	Symptoms of depressed mood or loss of interest that have been present for at least 2 weeks (and represent a change from their usual selves). <sup>106</sup>
<b>Divergent thinking</b>	The ability to solve problems with many possible solutions.
<b>Executive function</b>	A set of cognitive skills that are critical for advanced development and the execution of complex tasks (e.g., planning, organization, judgment).
<b>Mental health</b>	Emotional, psychological and social well-being.
<b>Neurodevelopmental (brain-based) disabilities</b>	Brain-based disabilities such as problems with motor function, cognition, learning, language and/or communication. <sup>107</sup> Examples include ADHD, autism spectrum disorder, cerebral palsy, fetal alcohol syndrome and developmental coordination disorder.
<b>Neuroplasticity</b>	The brain's ability to reorganize itself by forming new neural connections. <sup>82</sup>
<b>Neurotransmitters</b>	Brain chemicals that transmit signals from one neuron to the next across synapses (point of communication between two neurons).
<b>Neurotrophins</b>	Proteins that regulate the development, maintenance and function of the brain and spinal cord.
<b>Physical activity</b>	Any movement that uses energy and increases heart rate and breathing. <sup>108</sup>
<b>Physical literacy</b>	The motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life. <sup>109</sup>
<b>Quality of life</b>	A multi-dimensional concept that includes physical, mental, emotional and social functioning.
<b>Self-concept</b>	An individual's belief about themselves, including belief about their attributes, and who and what the "self" is. <sup>110</sup> Often includes self-esteem and self-worth.
<b>Self-esteem/self-worth</b>	The extent (either positive or negative) to which an individual likes/ accepts/approves/values themselves in relation to others.
<b>Stress reactivity</b>	The capacity or tendency to respond to a stressor (e.g., blood pressure rising in response to a stressor). <sup>111</sup>

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**REPORT CARD INDICATORS:**

# Daily Behaviours



## GRADE

# D+

# Overall Physical Activity

**The grade this year is a D+.** This slight improvement from the D- assigned in 2016 does not represent an actual increase in the proportion of children and youth meeting the age-specific physical activity benchmarks for this indicator. Rather, the grade change reflects a new approach to assessing benchmark adherence (see page 6 for a detailed explanation) and also a new approach to weighting the key findings by age group. Specifically, the proportion of 5- to 17-year-olds meeting their age-specific benchmark (approximately 35%; 2014-15 Canadian Health Measures Surveys [CHMS], Statistics Canada) was weighted as 87% (13/15 years) of the grade. The proportion of preschoolers (3- to 4-year-olds) meeting their benchmark (62%; 2009-11, 2012-13 and 2014-15 CHMS, Statistics Canada) was weighted as 13% (2/15 years) of the grade. Therefore, the overall weighted proportion of 3- to 17-year-olds meeting their age-specific benchmarks is 39%.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018
Grade	D	D	F	F	F	F	F	F	D-	D-	D-	D-	D+
Benchmark	<ul style="list-style-type: none"> <li>Percentage of children and youth who meet the physical activity recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth (at least 60 minutes of daily MVPA).<sup>52</sup></li> <li>Percentage of preschoolers who meet the physical activity recommendation within the Canadian 24-Hour Movement Guidelines for the Early Years (at least 180 minutes of daily physical activity, of which at least 60 minutes is energetic play).<sup>53</sup></li> </ul>												
Grading Scheme	A+ 94-100%			B+ 74-79%			C+ 54-59%			D+ 34-39%			
	A 87-93%			B 67-73%			C 47-53%			D 27-33%			F 0-19%
	A- 80-86%			B- 60-66%			C- 40-46%			D- 20-26%			

## Key Findings

- Approximately a third of children and youth in Canada meet the physical activity recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth:<sup>52</sup>
  - 35% of 5- to 17-year-olds (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
  - 36% of 5- to 17-year-olds (2009-11 and 2012-13 CHMS, Statistics Canada).<sup>54</sup>
  - 35% of 6- to 17-year-olds (2007-09, 2009-11, 2012-13 and 2014-15 CHMS, Statistics Canada).<sup>55</sup>
  - 35% of 10- to 17-year-olds based on self-report data (2013-14 Health Behaviour in School-Aged Children survey [HBSC], World Health Organization [WHO]/Public Health Agency of Canada [PHAC]).<sup>56</sup>
  - 41% of 5- to 19-year-olds take at least 12,000 daily steps on average, which approximates the physical activity recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth (2014-16 Canada's Physical Activity Levels Among Youth study [CANPLAY], Canadian Fitness and Lifestyle Research Institute [CFLRI]).<sup>Custom analysis</sup>
  - 33% of 8- to 12-year-olds take at least 12,000 daily steps on average (2014-17 Canadian Assessment of Physical Literacy [CAPL], Healthy Active Living and Obesity Research Group [HALO]).<sup>Custom analysis</sup>
- Regardless of how physical activity guideline adherence is assessed, there has not been a change in the MVPA levels of Canadian children and youth between 2007 and 2015.<sup>55</sup>
- 62% of 3- to 4-year-olds in Canada meet the physical activity recommendation within the Canadian 24-Hour Movement Guidelines for the Early Years (2009-11, 2012-13 and 2014-15 CHMS, Statistics Canada).<sup>57</sup>
- In a regional sample of toddlers from Edmonton, 99% meet the physical activity recommendation within the Canadian 24-Hour Movement Guidelines for the Early Years (2014-15 Parents' Role in Establishing Healthy Physical Activity and Sedentary Behaviour Habits [PREPS]).<sup>58</sup>
- In a small sample of Canadian children and youth with disabilities (e.g., cerebral palsy, spinal cord injury), approximately 16% report getting at least 60 minutes of daily physical activity at any intensity.<sup>59</sup>

## Research Gaps

- A better standardization and harmonization of objective physical activity assessment is needed in order to make more direct comparisons of physical activity levels across studies and populations.
- Children with disabilities (e.g., cerebral palsy, muscular dystrophy, spina bifida) are less likely to be physically active on their own<sup>60</sup> and report various barriers to participation in sport.<sup>61</sup> A recent systematic review concluded that increasing physical activity in children and youth with a physical disability is complex and efforts to do so are often unsuccessful, highlighting the need for further research.<sup>62</sup>
- National data are needed on physical activity levels and guideline adherence in Canadian infants and toddlers.
- National data are needed on the physical activity levels of children and youth with Indigenous heritage.
- More research is needed on how to approach and reduce the persistent gender disparity.
- More research is needed on how to attenuate the declines in physical activity that take place in the transition from the early years to the school years.
- More research is needed on the impact of light-intensity physical activity on health.

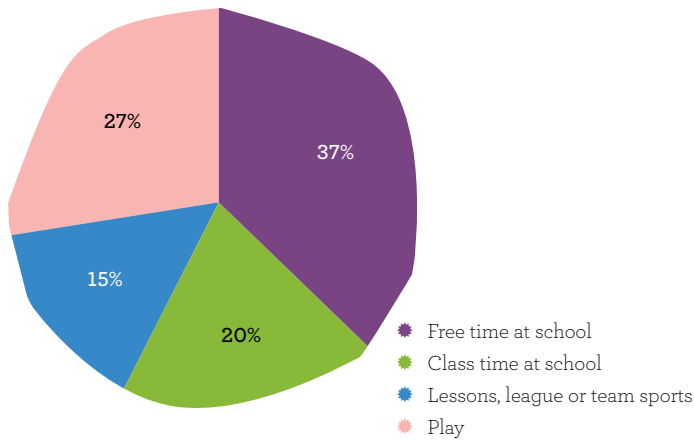
## Recommendations

- When developing strategies aimed at increasing physical activity, focus on reducing inequalities by targeting “high-risk” segments of the population (e.g., teenage girls, racial/ethnic minorities, low-income families).
- Promote MVPA among preschoolers, especially in light of its inclusion in the new Canadian 24-Hour Movement Guidelines for the Early Years.<sup>53</sup>
- Start efforts to promote physical activity in Canadian children as early as possible, given that evidence suggests physical activity patterns in early childhood continue into late childhood and potentially in adolescence.<sup>63,64</sup>

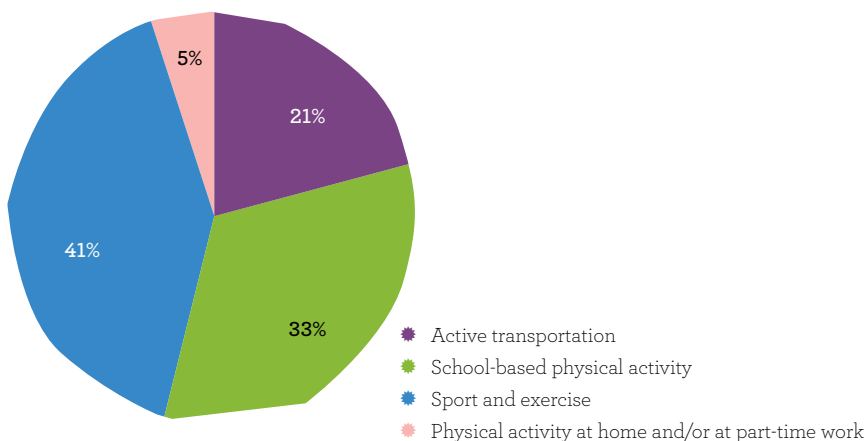
## Literature Synthesis

Accelerometer data from Statistics Canada reveal that 5- to 17-year-olds in Canada spend approximately 54 minutes per day in MVPA.<sup>54</sup> Preschoolers (3- to 4-year-olds) spend approximately 210 minutes and 68 minutes per day in light-intensity physical activity and MVPA, respectively.<sup>57</sup> Pedometer data from CFLRI show that 5- to 19-year-olds in Canada take approximately 11,300 daily steps, which is roughly equivalent to a little less than 60 minutes of daily MVPA (2014-16 CANPLAY).<sup>65</sup> Figures 2 and 3 describe a typical day of physical activity for 5- to 11-year-olds and 12- to 17-year-olds in Canada, respectively, by activity source.

**Figure 2.** Sources of weekday physical activity in 5- to 11-year-olds in Canada (source: 2014-15 CHMS, Statistics Canada<sup>Custom analysis</sup>). Note: percentages do not sum to 100 due to rounding.

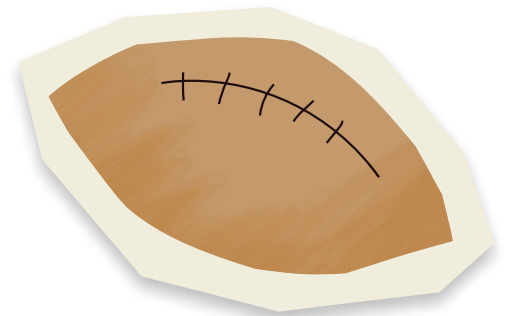


**Figure 3.** Sources of weekday physical activity in 12- to 17-year-olds in Canada (source: 2014-15 CHMS, Statistics Canada<sup>Custom analysis</sup>).



## Child and Youth Physical Activity Levels Have Not Changed—Only the Method of Assessment Has Changed

Since the release of the 2011 Report Card,<sup>66</sup> the proportion of children and youth getting at least 60 minutes of daily MVPA has been less than 10%, according to accelerometer data from national surveys.<sup>67,68,69,70,71</sup> The proportion is now approximately a third of children and youth, despite the fact that the physical activity recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth<sup>52</sup> has remained identical to that of its predecessor, the Canadian Physical Activity Guidelines for Children and Youth.<sup>72</sup> This, however, should not be interpreted as an improvement since the MVPA levels of Canadian children and youth have remained essentially unchanged since 2007.<sup>55</sup> Rather, the higher proportion of children and youth now meeting the physical activity recommendation reflects a change in how physical activity guideline adherence is assessed.<sup>54,55</sup> Historically, guideline adherence was operationalized as at least 60 minutes of daily MVPA on at least 6 days of the week. The release of the Canadian 24-Hour Movement Guidelines for Children and Youth in 2016 led to the adoption of a new operational definition – at least 60 minutes of daily MVPA *on average*. There are several reasons for the change, one of which is to ensure a consistent approach to guideline adherence assessment across all three movement behaviours (physical activity, sedentary behaviour and sleep).<sup>54</sup>



There is also a noticeable difference in the proportion of Canadian preschoolers now meeting the physical activity recommendation within the new Canadian 24-Hour Movement Guidelines for the Early Years (see Figure 11 in the *24-Hour Movement Behaviours* indicator on page 64):<sup>53</sup> between 2013 and 2016, the proportion ranged from 70%<sup>70,71</sup> to 84%.<sup>68,69</sup> An analysis published shortly after the release of the 2016 Report Card revealed that 73% of 3- to 4-year-olds get at least 180 minutes of daily physical activity at any intensity every day of the week (2009-11 and 2012-13 CHMS, Statistics Canada).<sup>73</sup> The latest proportion – 62%<sup>57</sup> – is based on the new Guidelines; the deviation from previous analyses is explained, in part, by a change in the physical activity recommendation for preschoolers itself. The previous guideline was at least 180 minutes of daily physical activity at any intensity. The new recommendation retains this threshold but requires that at least 60 minutes of the 180 daily minutes be spent in energetic play, or MVPA. As with children and youth, the operational definition for guideline adherence assessment in preschoolers now focuses on minutes of daily physical activity *on average* without regard for how many days in the past 7 days this threshold is met.<sup>57</sup> This also contributes to the change (62% vs. 73%) in the proportion of 3- to 4-year-olds meeting the physical activity recommendation. Therefore, the lower proportion should not be interpreted as a decline in the physical activity levels of Canadian preschoolers.

### Physical Activity in Children and Youth with Chronic Health Conditions

In the past, many children and youth living with chronic medical conditions (e.g., cardiac defects, asthma, cancer, epilepsy, diabetes) have been restricted, exempted or discouraged by care providers from participating in physical activity. Even today, children and youth with cardiovascular disease, chronic respiratory disease, diabetes and cancer spend more time in sedentary pursuits compared to otherwise healthy children and youth, and are typically not getting at least 60 minutes of daily MVPA.<sup>74</sup>



Studies have reported a variety of barriers to physical activity faced by children and youth with chronic conditions including risk of injury, a common perceived barrier that can be enforced by both care providers and those living with the chronic condition.<sup>75</sup> A recent study in children and youth with type 1 diabetes reveals that fears of becoming hypoglycemic and losing control over their condition are also barriers to regular physical activity.<sup>76</sup> In children living with sickle cell disease, the perceived burden of disease on physical activity as well as low physical mobility may serve as barriers.<sup>77</sup> Time of diagnosis may also be a factor to consider for some children living with chronic conditions: newly diagnosed children with arthritis and their parents are more likely to identify pain as a barrier to physical activity than those who have been diagnosed for a longer time.<sup>78</sup> As more research is done in these populations, it is hoped that evidence-based guidelines for many chronic conditions will become available, making it easier for clinicians, parents, and children and youth with chronic conditions to determine which types and intensities of physical activity are appropriate for them.

## Contributing Factors and Disparities

As noted in earlier Report Cards,<sup>79</sup> there are several persistent disparities in the physical activity levels of Canadian children and youth that show little evidence of diminishing. For example, 5- to 11-year-olds accumulate approximately 33% more daily MVPA on average than 12- to 17-year-olds (61 vs. 46 minutes) and are about twice as likely (48% vs. 24%) to meet the physical activity component of the Canadian 24-Hour Movement Guidelines for Children and Youth.<sup>54</sup> A similar disparity is evident when comparing physical activity by sex: boys accumulate approximately 28% more daily MVPA on average than girls (60 vs. 47 minutes), and the proportion of boys meeting the MVPA recommendation within the 24-Hour Movement Guidelines for Children and Youth is nearly double the proportion of girls (47% vs. 25%).<sup>54</sup> Other analyses of national datasets reveal similar disparities.<sup>55,56</sup>

## Physical Activity in Indigenous Children and Youth

Children, youth and young adults – those 24 years old and younger – make up 46% of the Indigenous population in Canada.<sup>80</sup> Unfortunately, many Indigenous children and youth face disparities in terms of access to physical activity programming compared to their non-Indigenous counterparts.<sup>81</sup> These disparities are due to multiple factors such as disempowerment, lack of resources, geographic remoteness and concerns about safety.<sup>82,83</sup> A study of grades 6 and 7 First Nations youth in a remote community on the western coast of James Bay, Ontario, revealed that 63% are affected by overweight or obesity and face numerous barriers to physical activity and sport participation despite getting more than 2 hours of daily MVPA.<sup>81</sup> In light of this, increased efforts to create opportunities for Indigenous youth living in remote communities may be warranted so that they can participate in organized physical activity programming.<sup>81</sup> There is also evidence that Indigenous youth (First Nations, Métis and Inuit) in urban settings perceive barriers to physical activity participation including place of residence (e.g., low-income neighbourhoods with high crime rates).<sup>84</sup> These data highlight the need for physical activity promotion efforts that are tailored specifically for Indigenous children and youth, reflecting the challenges and barriers they face.<sup>84</sup>



## GRADE

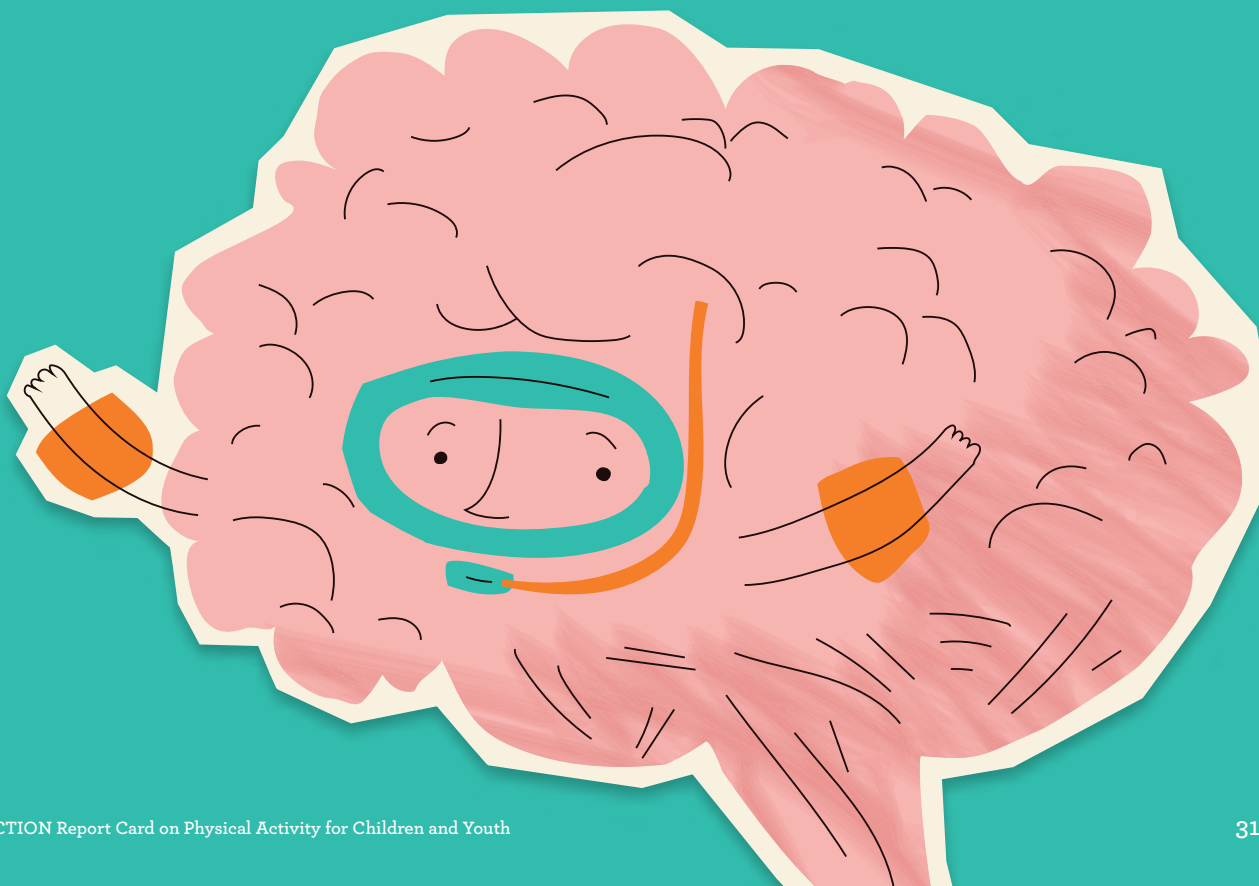
# D

## Active Play & Leisure Activities

**This year's grade is a D**, which represents a slight decline from the D+ assigned in 2016. A weighted approach was used to determine the grade. Specifically, the proportion of 5- to 11-year-olds meeting the benchmark (20%; 2014-15 CHMS, Statistics Canada) was weighted as 55% (6/11 years) of the grade. The proportion of 11- to 15-year-olds meeting the benchmark (37%; 2013-14 HBSC, WHO/PHAC) was weighted as 45% (5/11 years) of the grade. Therefore, the overall weighted proportion of 5- to 15-year-olds meeting the benchmark is approximately 28%. It should be noted that the target of several hours of active play per day is arbitrary, and further research is required to establish a benchmark that is linked to health outcomes.

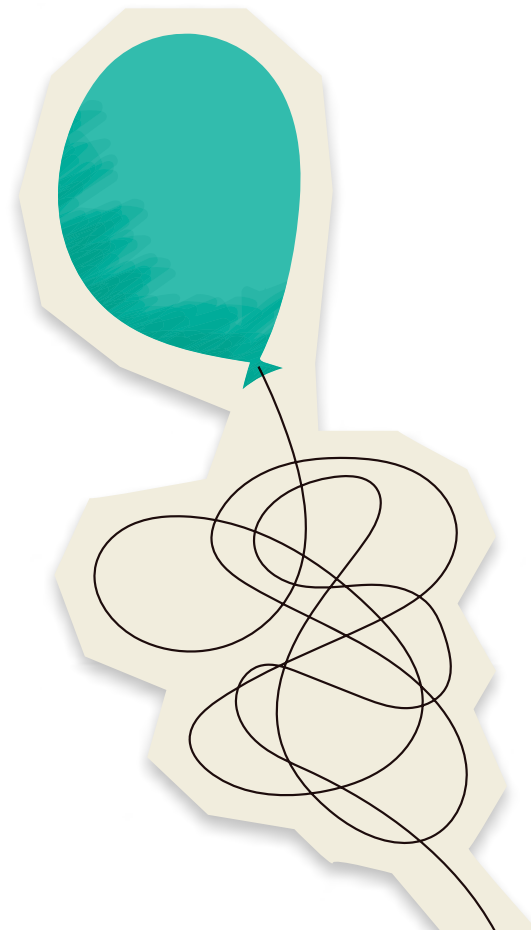
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018
Grade	–	–	–	INC	INC	F	F	F	INC	INC	INC	D+	D
Benchmark	* Percentage of children and youth who engage in active play and non-organized/unstructured leisure activities for several hours a day.												

Grading Scheme	A+ 94-100%	B+ 74-79%	C+ 54-59%	D+ 34-39%	
	A 87-93%	B 67-73%	C 47-53%	D 27-33%	F 0-19%
	A- 80-86%	B- 60-66%	C- 40-46%	D- 20-26%	



## Key Findings

- 20% of 5- to 11-year-olds in Canada spend several hours a day (> 2 hours) in unorganized physical activity, according to their parents (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 37% of 11- to 15-year-olds in Canada report playing outdoors for several hours a day (> 2 hours) outside of school hours (2013-14 HBSC, WHO/PHAC).<sup>Custom analysis</sup>
- Children and youth in Canada spend approximately 2 hours per day outdoors (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
  - 5- to 6-year-olds who are cared for in a non-school setting (some form of childcare outside of the home and outside of a school setting) spend 2.1 hours per day outdoors, according to their parents; those cared for at home spend 1.8 hours per day outdoors.
  - 6- to 11-year-olds spend 2.2 hours per day outdoors, according to their parents.
  - 12- to 14-year-olds report spending approximately 1.7 hours per day outdoors.
- Based on objective measurement (accelerometers, Global Positioning System [GPS] loggers, global information systems), 10- to 13-year-olds in Kingston, Ontario, spend approximately 33 minutes per day in active outdoor play.<sup>85</sup>
- 62% of 5- to 19-year-olds in Canada participate in outdoor play during the afterschool period, according to their parents (2014-16 CANPLAY, CFLRI).<sup>Custom analysis</sup>
  - These children and youth take approximately 2,500 more daily steps than those who do not participate in these activities.
- 28% of 5- to 11-year-olds in Canada spend at least 7 hours per week in unorganized physical activity (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 5- to 11-year-olds in Canada spend approximately 35 minutes per day in unorganized physical activity, either on their own or with friends, according to their parents (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 75% of 5- to 19-year-olds in Canada participate in unorganized physical activities or sports during the afterschool period, according to their parents (2014-16 CANPLAY, CFLRI).<sup>Custom analysis</sup>
  - These children and youth take approximately 1,900 more daily steps than those who do not participate in these activities.
- For the first time, the Report Card has active play data on preschoolers:
  - 46% of 3- to 4-year-olds in Canada spend at least 1 hour per day in unorganized physical activities, according to their parents (2012-13 and 2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
  - 3- to 4-year-olds in Canada who are cared for in a non-school setting spend 2.1 hours per day outdoors on average, according to their parents; those cared for at home spend 1.6 hours per day outdoors (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
  - 3- to 4-year-olds in Canada spend approximately 43 minutes per day in unorganized physical activity, either on their own or with friends, according to their parents (2012-13 and 2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>





## Research Gaps

- There continues to be a need for research (e.g., relationship between active play and health) in different settings (e.g., urban, rural, nature) that can help identify an evidence-based benchmark for daily active play.
- Active play research that uses both objective (e.g., accelerometry, GPS) and subjective (e.g., questionnaires, activity logs, interviews) measures is needed in order to enhance our understanding of active play.<sup>86,87</sup>
- A standardized approach to active play measurement is needed in order to improve comparisons of results across studies.<sup>86</sup>

## Recommendations

- Given the positive association between outdoor time and physical activity, focus on ensuring that adequate outdoor active play opportunities are afforded to children in a variety of settings (e.g., home, school, childcare).
- Embed nature in everyday places used by children, such as schools, backyards, parks, playgrounds and city streets, to make natural outdoor play spaces that promote physical activity.
- Involve children and youth in designing and planning natural spaces for recreation, education, inspiration and health, to give them ownership and pride in their local communities, schools and parks.



## Literature Synthesis

As noted in a previous Report Card,<sup>71</sup> play is generally difficult to define due to its complex and multi-faceted nature, but it does have some general defining characteristics (e.g., free and self-directed without direct adult supervision).<sup>88</sup> Owing to this difficulty, IKEA, in their recently released third Play Report,<sup>89</sup> took a qualitative approach and asked participants (children and adults from the United States, Germany and China) to describe when play ceases to exist rather than to define what it is. According to these respondents, play rarely exists when an activity becomes too serious, too passive, too frustrating or too obligated. Participants also identified six different forms of play including free-style play (e.g., fantasy role play), build-it play (e.g., building a sandcastle), mirror-me play (e.g., children mimicking adult behaviour), muddy-boots play (e.g., hide-and-seek), out-of-the-box play (e.g., artistic play such as colouring) and formal play (e.g., board games).<sup>89</sup> Active play – play done at movement intensities above resting and sedentary levels – would generally be classified into one of the first four (i.e., free-style, build-it, mirror-me and muddy-boots play) of these six forms of play.

Several Canadian researchers undertook a systematic review to explore the different definitions of active play available in the research literature.<sup>87</sup> Although there are varying definitions – due, in part, to the different backgrounds and training of those defining active play (e.g., education specialists, behavioural researchers) – common themes to most definitions include increased expenditures of energy, rough and tumble, gross motor movement, unstructured, freely chosen and fun.<sup>87</sup> Accordingly, these Canadian researchers have put forward the following working definition of active play as a first step to help advance active play research: **“a form of gross motor or total body movement in which young children exert energy in a freely chosen, fun, and unstructured manner.”**<sup>87</sup>

The difficulties with defining active play have also led to challenges with measuring it. A methodological review of active play and independent mobility (freedom to roam without adult supervision) research reveals that this research has taken many different approaches to measuring active play (and independent mobility), including accelerometry, GPS, direct observation, questionnaires, surveys, focus groups, activity logs, monitoring sheets, travel/activity diaries and behavioural maps.<sup>86</sup> Unfortunately, studies seldom use the same approach.<sup>86</sup>

## Benefits of Active Play

Unlike organized sports and structured physical activities, active play has no clear outcome or purpose.<sup>67</sup> However, this kind of play provides a valuable context for children: it is a chance for them to learn and be physically active while having fun.<sup>67</sup> When children are engaged in active play, they are typically moving freely – often with minimal or no adult control – and at an intensity that is above resting and sedentary levels.<sup>90</sup> Replacing just a single hour of screen time with active play can result in an additional energy expenditure of 49 calories.<sup>91</sup> A recent study among Canadian children and youth found that each additional hour spent outdoors was associated with 7 more minutes of daily MVPA, 762 more daily steps and 13 fewer minutes of daily sedentary time.<sup>92</sup> Outdoor play has been linked to improved working memory, social relationships (e.g., ability to develop and sustain friendships, to co-operate, to lead and follow) and emotional well-being (e.g., minimized anxiety, depression and aggression; increased happiness).<sup>92,93,94</sup> The outdoors also offers natural play spaces and elements that provide valuable physical and cognitive challenges for children, which help them:

- develop motor skills
- learn about their own potential and boundaries
- navigate their environment
- problem solve and manage risks<sup>95</sup>

In other words, active play can contribute to improved physical, emotional, social and cognitive development.<sup>96,97</sup>

## New Active Play Online Resources

Since the 2016 Report Card, several online resources for active and outdoor play have launched:

- **Toolkit to Increase Unstructured Play** ([www.cpha.ca/resources?topic=68](http://www.cpha.ca/resources?topic=68)): the Canadian Public Health Association has released a toolkit that provides evidence-based tools and resources to inform decision-making and reduce concerns about unstructured play in school and municipal settings. The toolkit also responds to common parent/guardian perceptions. The toolkit currently consists of 7 research summaries, 3 infographics and 2 project reports.
- **Outdoor Play Canada** ([www.outdoorplaycanada.ca](http://www.outdoorplaycanada.ca)) is a brand new network of leaders and organizations working together to galvanize an outdoor play movement across Canada. It sprang from the diverse, cross-sector group that collaborated to create the 2015 Position Statement on Active Outdoor Play.<sup>98</sup> A sign-up form is available on their website for those interested in joining their network.
- **Outside Play** ([www.outsideplay.ca](http://www.outsideplay.ca)) is a collaborative initiative between the University of British Columbia, the BC Children's Hospital, and the BC Injury Research and Prevention Unit. The purpose of this online tool is to help parents and communities reverse the trend that is limiting children's opportunities to play outside and take risks in play by helping users find a more balanced approach for them and their child through understanding the importance of risky play, working to manage the fear that can lead to setting too many limits, and building a plan of action for change.<sup>99</sup>

## Pokémon GO: Lots of Hype, But No Long-Term Behaviour Change

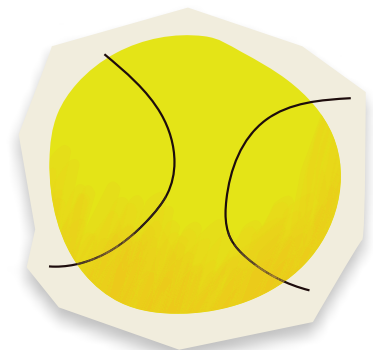
Pokémon GO, an augmented reality mobile game freely accessible to individuals around the globe, became the world's most downloaded smartphone application within two weeks of its release in July 2016.<sup>100</sup> Early reports – largely based on anecdotal evidence – suggested that the app had the potential to increase physical activity and time spent outdoors at the expense of indoor time.<sup>101,102</sup> One well-designed study that assessed these relationships

surveyed more than 1,000 18- to 35-year-olds and found that Pokémon GO contributed to 11 minutes of additional daily walking. Most notably, the impacts (minutes of additional walking) were most pronounced in individuals with obesity and from low-socio-economic backgrounds. Unfortunately, this increase in daily steps declined gradually over time, and no changes from baseline were observed 6 weeks after the baseline measurement.<sup>103</sup> Despite enormous hype, Pokémon GO in its current form appears unable to sustain long-term engagement and did not lead to long-term behaviour change.

## Contributing Factors and Disparities

Many factors influence the likelihood of children and youth engaging in active play and leisure activities. Data from the CANPLAY (2014-16 CANPLAY, CFLRI<sup>Custom analysis</sup>) survey continue to show that age-, sex- and socio-economic-related disparities are evident: younger children (5- to 10-year-olds) are most likely to play in unstructured physical activity and sport after school, and the proportion decreases with increasing age. Boys are more likely than girls to play in unstructured physical activity and sport after school. Children and youth with parents who have graduated from high school are more likely to play in unstructured physical activity and sport after school compared to their peers with parents who have a university education.

Studies abroad have found that, as expected, independent mobility and outdoor play increase with age.<sup>104,105</sup> Being younger, having a higher socio-economic status or having higher levels of pro-social behaviour may also be associated with lower levels of independent mobility and outdoor play.<sup>104</sup>



**GRADE**

**D-**

Active  
Transportation



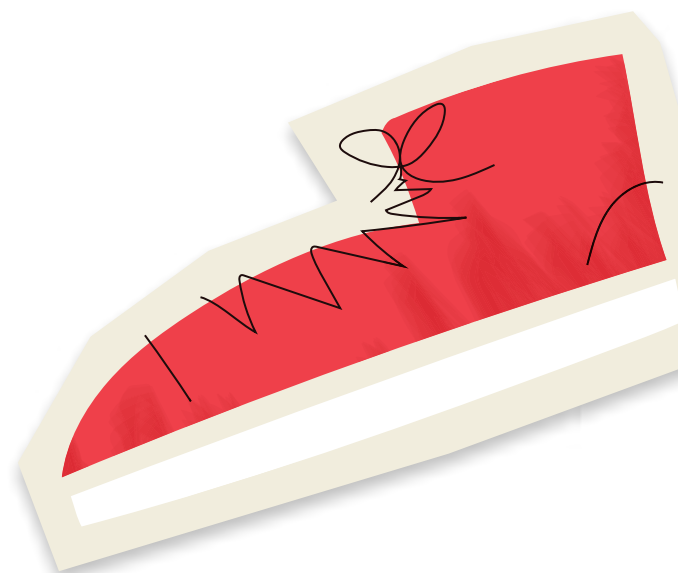
**The grade this year is a D-.** This slight decline from the D assigned in 2016 does not represent a decline in the proportion of children and youth using active transportation to get to/from school, which has been relatively stable over the past decade. Rather, the grade change reflects an adjustment to the grading system used in the 2018 Report Card versus the system used for the previous several years: previously, a D- would have been assigned when the proportion meeting the benchmark was in the 21-40% range and disparities or declines over time were present. Under the new grading system, a D- is assigned when the proportion meeting the benchmark is in the 20-26% range, regardless of disparities or declines over time. Although still a focus of attention within the Report Card, disparities and changes over time no longer influence indicator grades.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018
Grade	—	D	—	D	D	D	D	D+	D	D	D	D	D-
Benchmark	* Percentage of children and youth who typically use active transportation to get to and from places (e.g., school, park, mall, friend's house).												
Grading Scheme	A+ 94-100%			B+ 74-79%			C+ 54-59%			D+ 34-39%			F 0-19%
	A 87-93%			B 67-73%			C 47-53%			D 27-33%			
	A- 80-86%			B- 60-66%			C- 40-46%			D- 20-26%			

## Key Findings

- Based on parent- and self-report data in 5- to 19-year-olds in Canada, 21% typically use active modes of transportation (e.g., walk, bike), 63% use inactive modes (e.g., car, bus) and 16% use a combination of active and inactive modes of transportation to travel to and from school (2014-16 CANPLAY, CFLRI).<sup>106</sup>
  - 21% of 5- to 10-year-olds typically use active modes of transportation.
  - 24% of 11- to 14-year-olds typically use active modes of transportation.
  - 17% of 15- to 19-year-olds typically use active modes of transportation.
- 13% of students in grades 9 to 12 in Alberta, British Columbia, Nunavut, Ontario and Quebec report that they usually walk or bike to school in the morning. A higher proportion of students in grades 9 to 12 (19%) usually walk or bike home from school (2016-17 Cohort Study for Obesity, Marijuana Use, Physical Activity, Alcohol Use, Smoking and Sedentary Behaviour [COMPASS], University of Waterloo).<sup>Custom analysis</sup>

- 12- to 17-year-olds in Canada report spending an average of 15 minutes per day in active transportation (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
  - 45% spend at least 10 minutes per day in active transportation.
  - 26% spend at least 20 minutes per day in active transportation.
  - 15% spend at least 30 minutes per day in active transportation.
- Based on self-report data in students in grades 5 to 12 from Prince Edward Island, 9% typically use active modes of transportation, 73% use inactive modes and 18% use a combination of active and inactive modes of transportation to travel to and from school (2014-15 School Health Action Planning and Evaluation System – Prince Edward Island [SHAPES-PEI]).<sup>Custom analysis</sup>
- Based on objective data from a GPS tracker, 31% of trips made by 10- to 13-year-olds in Kingston, Ontario, are taken via active modes of transportation (25% walking, 6% cycling).<sup>107</sup>
  - These children spend 10 minutes per day in active transportation, which is far less than the 57 minutes per day they spend in vehicle travel.
  - The most common active travel destinations, in order of commonality, are home, school, store, and someone else’s home (e.g., a friend’s house).



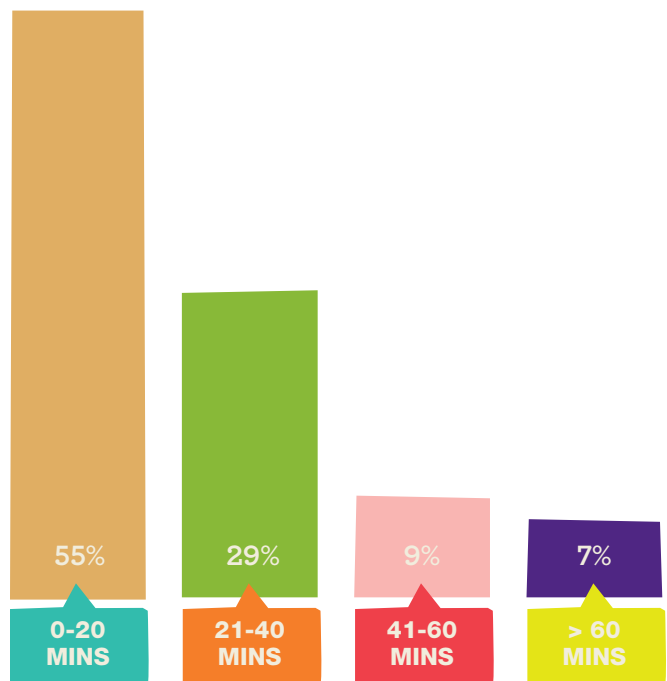
## Research Gaps

- Although the focus of active transportation research is starting to move beyond the school trip,<sup>107,108</sup> more research is needed on active transportation to destinations such as parks, stores, recreation facilities and other places.
- Due to low participation in cycling in Canada, few studies have examined the factors associated with cycling.<sup>109</sup> A study in Toronto found that although only 2-3% of children biked to or from school, about 40% would prefer to do so. Future studies should examine how children’s preferences for cycling could be harnessed in interventions.<sup>110</sup>
- A child’s independent mobility range (i.e., their freedom to move around in public space without adult supervision) is positively associated with their active transportation and overall physical activity levels.<sup>111,112</sup> More research is needed on how to facilitate children’s independent mobility.
- More research is needed on the use of mixed modes of transportation to and from destinations.

## Recommendations

- Create a culture of active transportation, similar to many European and African nations<sup>113</sup> where active transportation is the norm; this may involve alleviating parental safety concerns (e.g., stranger danger) by informing them of the low risks involved.<sup>98</sup>
- Lower speed limits in school areas – given that many schools are located in areas with speed limits in excess of 60 km/h – in order to reduce the risk and severity of crashes.<sup>114</sup> The city of Edmonton, as part of its Vision Zero initiative, has initiated lower speed zones around all elementary and junior high schools during the school day, and around all playgrounds from 7:30 am to 9:00 pm, 7 days a week.<sup>115</sup>
- Implement traffic-calming devices (e.g., speed bumps/humps, chicanes, narrower intersections) to enhance compliance with speed limits. Their presence may support active transportation.<sup>116</sup> Such measures may be particularly needed in low-income areas, where more children engage in active transportation<sup>117,118</sup> and face a greater risk of road injuries.<sup>119</sup>

- Hire more crossing guards at busy intersections near schools.<sup>116,120</sup>
- Consider more progressive policies for low-income areas, which face additional difficulties in accessing funding for active transportation interventions.<sup>121</sup>
- Consider children’s active transportation when deciding where to build new schools and recreation facilities.<sup>122</sup>
- Encourage schools to identify nearby “drop-off spots” from which driven children could safely walk to school in groups, akin to a walking school bus.<sup>123,124</sup>



**Figure 4.** Proportion of 12- to 17-year-olds in Canada who spend daily time in active transportation, by time block (source: 2014-15 CHMS, Statistics Canada<sup>Custom analysis</sup>).



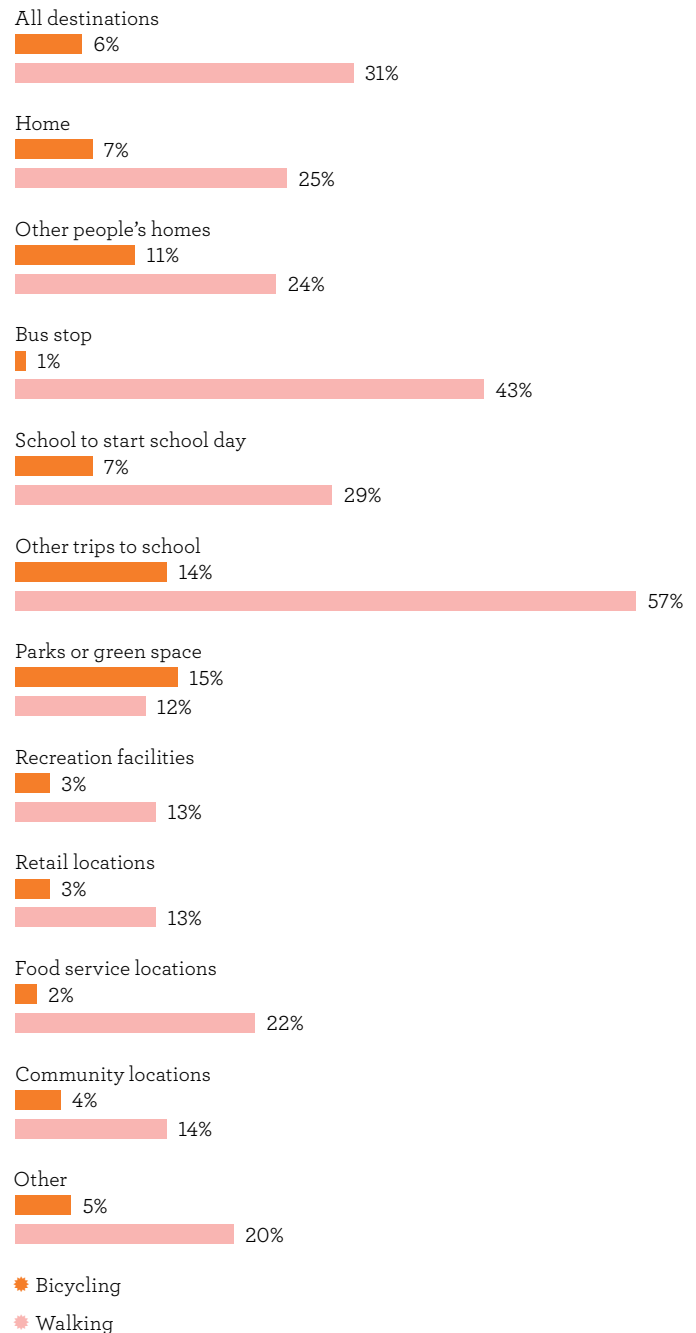
## Literature Synthesis

Time spent in active transportation and travel destinations can now be quantified objectively using GPS and geographic information system (GIS) data. A new study based out of Kingston, Ontario, that used this technology found that 10- to 13-year-olds spend an average of 10 minutes per day in active transportation; it also provides detailed information about the proportion of weekly trips by destination (Figure 5). The most common destinations are home, school, other people's homes, and parks or green spaces.<sup>107</sup> A previous study in the Halifax area using GPS and GIS found that active transportation is the greatest contributor to physical activity among youth living in urban and suburban areas.<sup>125</sup>

## Benefits of Active Transportation

Systematic reviews confirm that children who walk or bike to school are more physically active.<sup>112,126,127</sup> A meta-analysis that combined studies on walking to/from school and physical activity measured by accelerometry found that elementary school students who walk to school get an additional 17 minutes of daily MVPA, which equates to 23% of their total daily physical activity, whereas high school students who walk to school get an extra 14 minutes of daily MVPA or 36% of their total daily physical activity.<sup>127</sup> Thus, active transportation may be particularly important for adolescents, who are usually less physically active than younger children.

Biking to/from school is consistently associated with better cardiovascular fitness.<sup>126</sup> A study found that Canadian adolescents who biked at least 1 hour per week had higher cardiovascular fitness, a lower body mass index, a lower waist circumference and a more favourable cholesterol profile than those who did not bike for transportation.<sup>128</sup> Evidence also shows that active transportation is related favourably to indicators of mental well-being: children and parents report more positive emotions during active travel compared with motorized travel<sup>129</sup> and, in a large Chinese study, active travellers were less likely to experience depressive symptoms.<sup>130</sup> Increased use of active transportation can also minimize vehicle exhaust emissions, which contribute to cardiovascular and lung diseases as well as climate change.<sup>131</sup>



**Figure 5.** Proportion of weekly trips that 10- to 13-year-olds in Kingston, Ontario, make to different destinations, by active transportation mode (bicycling or walking).<sup>107</sup>

## Do Active Transportation Interventions Work?

A recent systematic review identified 30 active transportation interventions published between 2010 and 2016.<sup>132</sup> Of these, approximately half (13/30) achieved statistically significant increases in active transportation, eight found no changes, four reported inconsistent results and five did not report whether observed changes were statistically significant. Although it is possible to increase the use of active transportation, intervention quality should be improved.<sup>132</sup> The large majority of interventions were delivered in elementary schools, underscoring a need for interventions targeting teens.<sup>132</sup> Because many children and youth live too far from their school to travel there actively, and travelling to school represents only a portion of all trips that are made, interventions aiming to promote active transportation to and from other destinations such as parks, shops, sport venues, and friends' and relatives' houses should be implemented as well.<sup>133</sup>

## Toward a National Active Transportation Strategy

In 2017, Canada Bikes, Green Communities Canada and the National Active and Safe Routes to School Working Group established an active transportation alliance asking the federal government to adopt and fund a national active transportation strategy.<sup>134</sup> They recommend that the strategy: **(1)** set bold, achievable targets for increased walking and cycling; **(2)** establish agreement about the benefits of active transportation, barriers and solutions, and priority actions; **(3)** develop collaboration among all levels of government, organizations, businesses and others; **(4)** establish mechanisms for monitoring progress and accountability; and **(5)** shape infrastructure investments and transformative policy initiatives.

## Contributing Factors and Disparities

Many factors influence the likelihood of children and youth engaging in active transportation, and these factors vary across countries.<sup>135</sup> Canadian studies have shown that active transportation is more likely if children and youth:

- live closer to school<sup>116,136,137,138</sup>
- are boys rather than girls,<sup>107,116,139,140</sup> especially for cycling<sup>128</sup>
- are in the tween years compared to early childhood and adolescence when school is the destination,<sup>141</sup> although total time spent engaging in overall active transportation may increase with age<sup>107</sup>
- are granted more independent mobility<sup>111</sup>
- have parents who provide more support for active transportation<sup>142</sup>
- live in more walkable areas,<sup>108</sup> although one study found that youth living in more sprawled areas actually spent more time engaging in active transportation<sup>143</sup>
- live in more socio-economically deprived areas<sup>117,118,144</sup>
- live in the Western provinces compared to the Atlantic provinces<sup>139,144</sup>






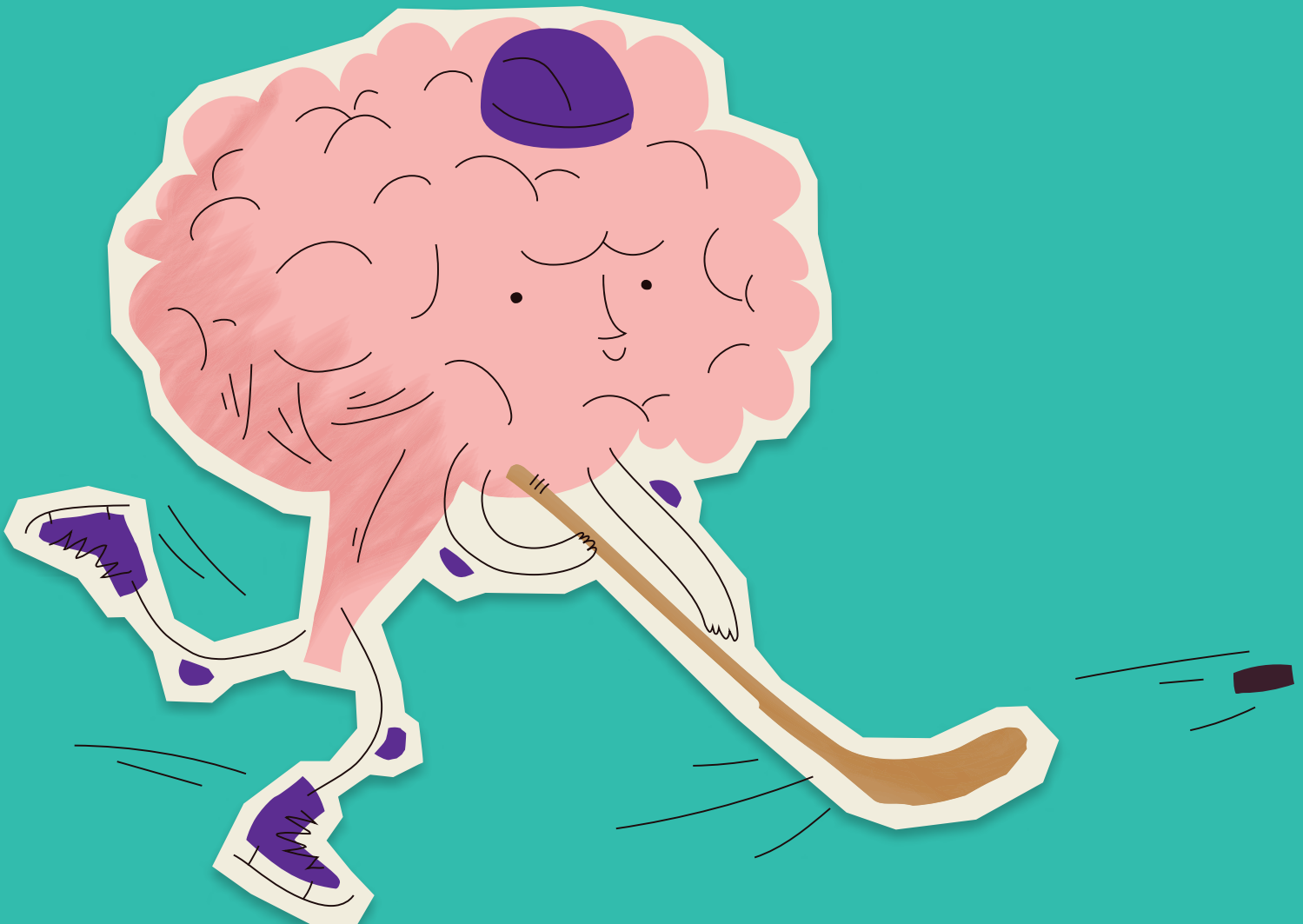
**GRADE**

**B**

# Organized Sport Participation

**This year's grade is a B** for the second consecutive Report Card. New data continue to show that the majority of Canadian children and youth participate in organized sport.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018
Grade	C+	C-	C	C	C	C	C	C	C	C+	B-	B	B
Benchmark	 Percentage of children and youth who participate in organized sport programs.												
Grading Scheme	A+ 94-100%			B+ 74-79%			C+ 54-59%			D+ 34-39%			
	A 87-93%			B 67-73%			C 47-53%			D 27-33%			F 0-19%
	A- 80-86%			B- 60-66%			C- 40-46%			D- 20-26%			



## Key Findings

- Approximately three quarters of children and youth in Canada participate in organized physical activity or sport:
  - 77% of 5- to 19-year-olds participate in organized physical activity or sport, according to their parents (2014-16 CANPLAY, CFLRI).<sup>145</sup>
  - 76% of 11- to 15-year-olds currently participate in organized sports, based on self-report data (2013-14 HBSC, WHO/PHAC). Custom analysis
  - 72% of 6- to 11-year-olds spend time each week taking part in physical activity outside of school that makes them out of breath or warmer than usual while participating in lessons or league or team sports, according to their parents (2007-13 CHMS, Statistics Canada).<sup>146</sup>
  - 69% of 5- to 11-year-olds spend time each week taking part in physical activity outside of school that makes them out of breath or warmer than usual while participating in lessons or league or team sports, according to their parents (2014-15 CHMS, Statistics Canada). Custom analysis
- 5- to 11-year-olds accumulate approximately 19 minutes per day in physical activity through participation in organized lessons, or league or team sports, according to their parents (2014-15 CHMS, Statistics Canada). Custom analysis
- 19% of 5- to 11-year-olds spend at least 4 hours per week in physical activity through participation in organized lessons, or league or team sports, according to their parents (2014-15 CHMS, Statistics Canada). Custom analysis
- 12- to 17-year-olds report spending approximately 29 minutes per day in organized/unorganized sport and exercise during leisure time (2014-15 CHMS, Statistics Canada). Custom analysis
- Approximately 671,000 high school students participate in high school sport (2016-17 School Sport Canada). Custom analysis
- 46% of 5- to 19-year-olds participate in organized physical activities or sports during the afterschool period, according to their parents (2014-16 CANPLAY, CFLRI). Custom analysis
- 46% of 3- to 4-year-olds spend time in physical activity through participation in organized lessons, or league or team sports, according to their parents (2012-13 and 2014-15 CHMS, Statistics Canada). Custom analysis
- Preschoolers accumulate approximately 7 minutes per day in physical activity through participation in these activities.
- 13% of preschoolers accumulate at least 2 hours per week in physical activity through participation in these activities.
- 33% of preschoolers accumulate less than 2 hours per week in physical activity through participation in these activities.



## Research Gaps

- More research is needed on when to reintroduce children and youth to physical activity after sustaining a sports-related concussion, and what types of activities are safe. Recent evidence reveals that children and youth who return to light-intensity physical activity within 7 days of a concussion have a reduced risk of experiencing persistent post-concussive symptoms (e.g., headaches, dizziness, fatigue) four weeks later compared to those who do not return to physical activity within the first 7 days.<sup>156</sup>
- More information is required on the potential impact of subsidizing participation in sport and recreation for children and youth living in low-income households (e.g., municipal discounts, KidSport, Jump Start).
- Similar to the cost of a food basket, it would be useful to determine the cost for a child to participate in sport/recreation in various communities across the country.
- There is a need for more data on physical activity, sport and/or recreation participation among Indigenous children and youth. In addition, tracking of progress on the sport and recreation recommendations in the Truth and Reconciliation Commission report should be conducted on a regular basis.

## Recommendations

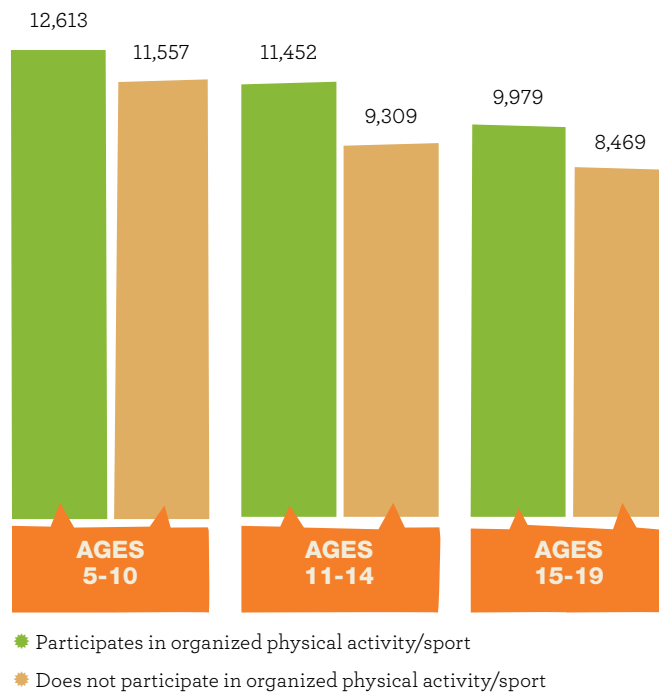
- Ensure easy and fair access across urban and rural settings and across socio-economic status levels for both individual and team sports.
- Continue promoting organized and recreational sports and activities to children with disabilities, in order to enable early participation and to possibly boost retention over time.
- Consider exposing young children to a variety of different sports (“sport sampling”), as opposed to early sport specialization, since data have shown that this approach is more favourable for continued sport and/or leisure activity participation in adolescence.<sup>147</sup>
- Encourage those who administer sport programs to develop and implement strategies that reduce dropout rates, minimize athlete burnout, and have balanced exercise-to-recovery ratios to decrease the likelihood of overuse injuries.
- Encourage sport administrators to schedule sport seasons that allow participation in multiple sports.



## Literature Synthesis

Organized sport can serve as a key context where children and youth receive their daily physical activity. National data from Canada show that 5- to 19-year-olds who participate in organized physical activity and sport take approximately 2,000 more daily steps compared to those who do not participate in these activities (Figure 6).<sup>145</sup> A recent systematic review also reveals that sport participation in childhood is positively associated with MVPA and, in some studies, sport participation persists into adolescence and early adulthood.<sup>5</sup>

Sport participation is associated with a number of health benefits in children and youth. For example, time spent participating in sport is positively related to several indicators of neurocognitive functioning in boys including inhibition, short-term memory, working memory and lapses in attention.<sup>93</sup> These indicators are considered important for functions of daily living such as autonomous behaviour, quality of life and academic performance.<sup>93</sup> Other recent studies have also reported a positive link between sport participation and various daily living (e.g., greater health-related quality of life<sup>148</sup>) and academic (e.g., improved grades,<sup>16,149</sup> improved interactions with peers,<sup>16</sup> lower school-related stress<sup>16</sup>) outcomes in children and youth. A five-year longitudinal study found that Canadian adolescents who consistently participate in team sports during high school (i.e., every three months) have lower depression scores in early adulthood.<sup>6</sup> An interesting study out of Western Canada reported that medical school students who participated in the past or currently participate in competitive sport at higher levels (e.g., local, provincial, national and international levels) generally experience lower levels of academic burnout (physical, cognitive and emotional exhaustion).<sup>150</sup> Sport participation may be inversely related to obesity in children and youth; however, the evidence is currently inconclusive.<sup>5,151</sup> Some evidence of an inverse association between sport participation and recreational screen time (TV viewing, video game use) exists, but the relationship is weak.<sup>152</sup>



**Figure 6.** Average daily steps taken stratified by age and participation in organized sport (source: 2014-15 CANPLAY, CFLRI<sup>145</sup>).

New research and increased attention continues to be directed toward sport-related brain injuries. In 2014-15, more than 15,000 emergency department visits occurred in Ontario and Alberta for sport-related brain injuries in children and youth, the majority of which were concussion-related (94%).<sup>153</sup> These emergency department visits have increased 46% in the last five years, with a disproportionate increase in younger children (78% in 0- to 9-year-olds vs. 45% in 10- to 17-year-olds).<sup>153</sup> However, not all sporting activities are equal: the incidence of sport-related brain injuries in hockey is nearly double the rates found in cycling, football/rugby and skiing/snowboarding.<sup>153</sup> Related data from 11- to 12-year-old hockey players in Alberta and Quebec reveal that concussion incidence is almost four times greater among players in a contact league compared to their peers playing in

a league where body checking is not permitted.<sup>154</sup> Sport-related brain injuries are not only a Canadian phenomenon: approximately 300,000 youth in the United States sustain concussions annually from participation in organized physical activity and sport.<sup>155</sup> Preliminary evidence suggests that, in the case of acute concussions, children and youth who return to physical activity (e.g., light-intensity, noncontact drills) within seven days are at lower risk for persistent post-concussive symptoms (e.g., headaches, dizziness, fatigue) compared to those who do not return to physical activity within seven days of an acute concussion.<sup>156</sup> A recent systematic review concluded that a sport-related concussion should be followed by a brief period of rest and a gradual return to symptom-limited physical activity (physical activity that is discontinued when symptoms occur).<sup>157</sup>

### The 5th International Consensus Statement on Concussion in Sport

The 5th International Consensus Statement on Concussion in Sport,<sup>158</sup> which was released in April 2017, uses the most current evidence to provide guidelines on the prevention, recognition, assessment and management of sport concussions. It builds on the principles of previous statements and further develops the current understanding of sport-related concussions using an expert consensus-based approach; it is intended for physicians and healthcare providers involved in athlete care at recreational, elite and professional levels. Visit [bjsm.bmj.com/content/51/11/838](http://bjsm.bmj.com/content/51/11/838) to view the Statement.

Based on the scientific evidence in the 5th International Consensus Statement on Concussion in Sport, Parachute Canada (Parachute) released the new Canadian Guideline on Concussion in Sport in July 2017.<sup>159</sup> This Guideline, developed by Parachute with their Expert Advisory Concussion Subcommittee, creates the foundation for a more consistent approach to concussion across the country, which will allow participants to play safer and continue training, competing, and enjoying a full, active life.<sup>159</sup> Visit [www.parachutecanada.org/injury-topics/item/canadian-guideline-on-concussion-in-sport](http://www.parachutecanada.org/injury-topics/item/canadian-guideline-on-concussion-in-sport) to view the Guideline.

## Contributing Factors and Disparities

The proportion of children and youth playing organized sport has remained relatively stable since 2005, and no sex-related differences exist in overall participation rates.<sup>145</sup> However, age- and socio-economic-related disparities help explain some of the differences seen in participation rates. For example, 15- to 19-year-olds in Canada are less likely to participate in organized sport compared to children and youth under 15 years of age.<sup>145</sup> Children and youth with parents having post-secondary education, and those in the highest-income households ( $\geq \$100,000/\text{year}$ ), are also more likely to participate in organized sport.<sup>145</sup>

### Increasing Sport Participation Among Members of Under-Represented Groups in Canada

Despite the many benefits of sport, there are groups in Canada (e.g., new Canadians; Canadians living in rural, remote and isolated regions) with participation rates below that of their peers.<sup>160</sup> A report from the Federal-Provincial-Territorial Sport, Physical Activity and Recreation Committee offers an evidence base for program and policy development aimed at increasing sport participation within these groups.<sup>160</sup> The recommendations include: (1) developing programs to introduce basic skills and improve physical literacy for all ages, abilities and skill levels; (2) when designing programs, involve those for whom the programs are being developed; and (3) removing economic, social and other barriers.<sup>160</sup> To access the full report, visit [www.sirc.ca/csp2012](http://www.sirc.ca/csp2012).



# GRADE

# C-

## Physical Education



**The benchmarks for this new indicator** relate to the proportion of children and youth who are taking physical education (PE) and daily physical activity (DPA) in contrast to what schools are offering, which is the concern of the School indicator. The grade for the Physical Education indicator is a C- based on a weighted approach to grading. Specifically, the proportion of K-8 students receiving at least 150 minutes of PE per week (33%; 2015 Opportunities for Physical Activity at School Study [OPASS], CFLRI) was weighted as 71% (10/14 school years) of the grade. The proportion of high school students taking PE (approximately 67%; 2015 OPASS, CFLRI and 2016-17 COMPASS, University of Waterloo) was weighted as 29% (4/14 school years) of the grade. Therefore, the overall weighted proportion of K-12 students meeting their age-specific benchmarks is approximately 43%.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018
Grade	—	—	—	—	—	—	—	—	—	—	—	—	C-
Benchmark	<ul style="list-style-type: none"> <li>Percentage of K-8 students receiving at least 150 minutes of physical education per week.</li> <li>Percentage of high school students taking physical education.</li> <li>Percentage of students receiving daily physical activity DPA in provinces that have DPA policies.</li> </ul>												
Grading Scheme	A+ 94-100%		B+ 74-79%		C+ 54-59%		D+ 34-39%		F 0-19%				
	A 87-93%		B 67-73%		C 47-53%		D 27-33%						
	A- 80-86%		B- 60-66%		C- 40-46%		D- 20-26%						

## Key Findings

- According to school administrators who reported on physical education (PE) time, 33% of grade K-8 students in Canada are getting at least 150 minutes of PE per week (2015 Opportunities for Physical Activity at School Study [OPASS], CFLRI).<sup>Custom analysis</sup>
- 72% of high school students in Canada are taking PE, according to school administrators (2015 OPASS, CFLRI).<sup>Custom analysis</sup>
- 61% of students in grades 9 to 12 in Alberta, British Columbia, Nunavut, Ontario and Quebec are taking a PE class in the current school year (2016-17 COMPASS, University of Waterloo).<sup>Custom analysis</sup>
- 92% of 5- to 11-year-olds in Canada get at least 150 minutes per week of physical activity at school, according to their parents (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 34% of 12- to 17-year-olds in Canada report getting at least 150 minutes per week of physical activity at school (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 97% of 5- to 11-year-olds in Canada get at least 20 minutes per day of physical activity at school, according to their parents (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 42% of 12- to 17-year-olds in Canada report getting at least 20 minutes per day of physical activity at school (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 50% of 5- to 11-year-olds in Canada get at least 4 hours per week of physical activity during their free time at school, according to their parents. 37% get from 2 to less than 4 hours per week, and 13% get less than 2 hours per week (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 51% of 5- to 11-year-olds in Canada get at least 2 hours per week of physical activity during class time at school, according to their parents (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 12- to 17-year-olds in Canada get 24 minutes of physical activity per day at school, based on self-report (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>



## Research Gaps

- Research that better informs the benchmarks for this indicator is needed.
- More research is needed on the implementation status of PE and daily DPA policies in Canada.
- The apparent disconnect between the presence of PE/DPA policies and low participation rates warrants further research to explore barriers to higher participation rates.<sup>161</sup>
- More research is needed on best practice approaches for integrating physical activity and sedentary reduction into non-PE and DPA areas of the curriculum (e.g., adding movement to a math lecture).
- Research that explores school-based PE interventions which target higher-intensity physical activity (MVPA) is needed to support children and youth of all ages in achieving optimal health benefits.
- More research is needed on the quality of PE programming (e.g., well-planned lessons incorporating a wide range of activities; high level of participation by all students in each class; emphasis on fun, enjoyment, success, fair play, self-fulfillment and personal health; appropriate activities for the age and stage of each student<sup>162</sup>).

## Recommendations

- Promote PE to children and youth as a fun, inclusive and welcoming school subject that gets them moving, and avoid focusing on sport-specific drills, specialization techniques, etc., that may reduce the individual's enjoyment and willingness to participate.
- Invest in the training and competency skills of PE teachers to ensure high-quality PE program delivery.
- Use the school curriculum as a venue to foster positive physical activity behaviours outside of school hours.<sup>163</sup>
- Prioritize physical activity at schools and treat PE as being as important as other core subject areas (science, math, reading, social studies, etc.).

## Literature Synthesis

There are a number of contexts and opportunities for physical activity at school (e.g., recess, in-classroom activity breaks<sup>164,165</sup>), including PE. Currently available data suggest that a high proportion (> 90%) of Canadian children and younger youth are enrolled in PE, with a sharp decline as students enter high school, likely because PE typically becomes optional at this point (Figure 7). Results from the 2016-17 COMPASS study reveal that 61% of students in grades 9 to 12 in Alberta, British Columbia, Nunavut, Ontario and Quebec are taking a PE class in the current school year (2016-17 COMPASS, University of Waterloo).<sup>Custom analysis</sup>

## Physical Education and Daily Physical Activity

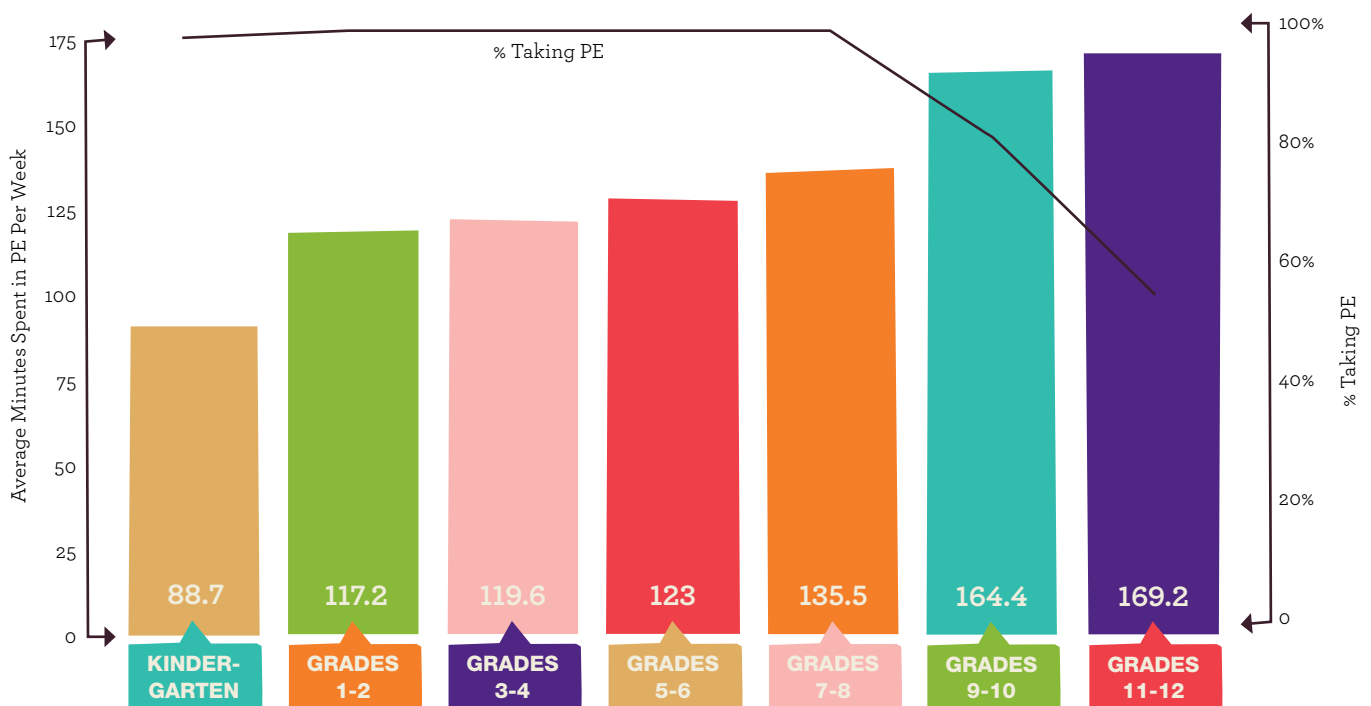
PE is often proposed as an important context for facilitating physical activity,<sup>161</sup> and there is research showing a positive link between PE enrollment and physical activity. For example, an international study of 9- to 11-year-olds from 12 countries – including Canada – found that PE class attendance was

associated with more daily physical activity and less sedentary time on weekdays.<sup>166</sup> Among students in grades 5 to 8 in Ontario, each additional PE class taken in the previous week was associated with a 14% increase in the odds of being highly active, which was defined as being among the top 33% most active participants in the study.<sup>167</sup> Among students in grades 11 and 12 in Manitoba, those enrolled in PE accumulated slightly more daily MVPA than those not enrolled in PE, and were also more likely to achieve the physical activity recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth.<sup>168</sup> An American study found that grade 3 students accumulated more MVPA in PE than in many other segments of the day (exergaming, recess, lunch, after school).<sup>169</sup> There is some mixed evidence, however. In a study of students in grades 11 and 12, there were no differences in daily MVPA levels among students in Manitoba (where PE is mandatory) and their counterparts in Alberta and Prince Edward Island (where PE is not mandatory).<sup>170</sup>

## Contributing Factors and Disparities

National data from the Opportunities for Physical Activity at School Study (OPASS) show that children and younger youth in Canada are more likely to be enrolled in PE than high school students (Figure 7).

**Figure 7.** Average minutes Canadian students spend in PE per week, and the proportion taking PE (source: 2011 OPASS, CFLRI<sup>67</sup>).

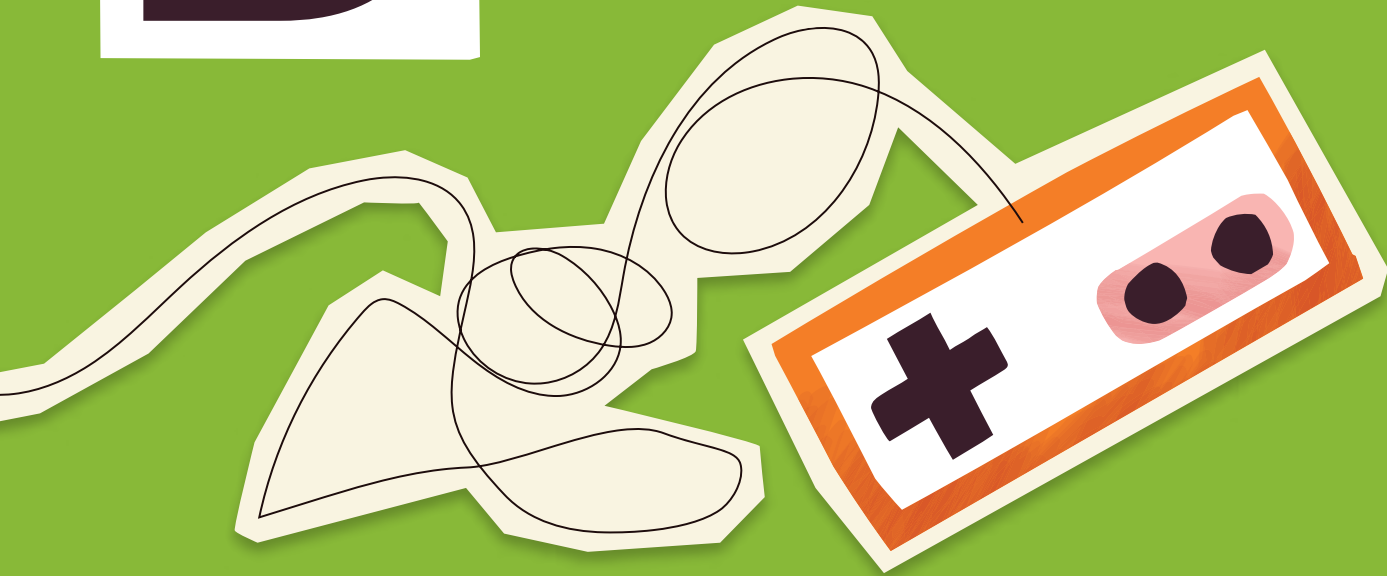




**GRADE**

**D**

Sedentary Behaviours



**The grade this year is a D.** This improvement from the F assigned in 2016 does not represent an increase in the proportion of children and youth meeting their age-specific screen time recommendations. Rather, the grade change reflects a new approach to how the key findings are weighted by age group (see page 6). Specifically, the proportion of 5- to 9-year-olds meeting their benchmark (approximately 64%; 2014-15 CHMS, Statistics Canada) was weighted as 33% (5/15 years) of the grade. The proportion of 10- to 17-year-olds meeting their benchmark (8%; 2013-14 HBSC, WHO/PHAC) was weighted as 53% (8/15 years) of the grade. Finally, the proportion of preschoolers (3- to 4-year-olds) meeting their benchmark (24%; 2009-11, 2012-13 and 2014-15 CHMS, Statistics Canada) was weighted as 13% (2/15 years) of the grade. Therefore, the overall weighted proportion of 3- to 17-year-olds meeting their age-specific benchmarks is 29%.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018
Grade	C-	D-	D-	D	F	F	F/INC*	F/INC*	F	F	D-	F	D

**Benchmark**

- Percentage of children and youth who meet the screen time recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth (no more than 2 hours of recreational screen time per day).<sup>52</sup>
- Percentage of preschoolers who meet the screen time recommendation within the Canadian 24-Hour Movement Guidelines for the Early Years (no more than 1 hour of sedentary screen time per day).<sup>53</sup>

Both Guidelines currently provide a time limit recommendation for screen-related pursuits, but not for non-screen-related pursuits.

\* In 2011 and 2012, there were two separate indicators: Screen-Based Sedentary Behaviours and Non-Screen Sedentary Behaviours. Following 2012, these indicators were collapsed into a single indicator.

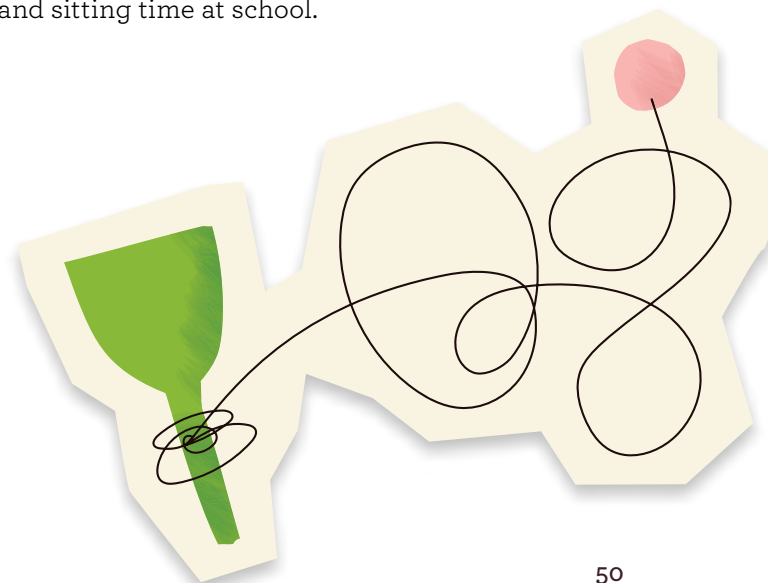
<b>Grading Scheme</b>	<b>A+ 94-100%</b>	<b>B+ 74-79%</b>	<b>C+ 54-59%</b>	<b>D+ 34-39%</b>	
	<b>A 87-93%</b>	<b>B 67-73%</b>	<b>C 47-53%</b>	<b>D 27-33%</b>	<b>F 0-19%</b>
	<b>A- 80-86%</b>	<b>B- 60-66%</b>	<b>C- 40-46%</b>	<b>D- 20-26%</b>	

## Key Findings

- The proportion of children and youth in Canada meeting the screen time recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth varies considerably by dataset and age group.<sup>52</sup>
  - 45% of 5- to 17-year-olds (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
  - 49% of 5- to 17-year-olds (2009-11 and 2012-13 CHMS, Statistics Canada).<sup>54</sup>
  - 54% of 8- to 12-year-olds (2014-17 CAPL, HALO).<sup>Custom analysis</sup>
  - 8% of 10- to 17-year-olds (2013-14 HBSC, WHO/PHAC).<sup>56</sup>
  - 6% of students in grades 9 to 12 in Alberta, British Columbia, Nunavut, Ontario and Quebec (2016-17 COMPASS, University of Waterloo).<sup>Custom analysis</sup>
- 5- to 11-year-olds and 12- to 17-year-olds in Canada spend 2.3 and 4.1 hours per day, respectively, in screen time pursuits (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 77% of 5- to 19-year-olds in Canada report watching TV, playing computer or video games, or reading during the afterschool period (from the end of school until dinner) (2014-16 CANPLAY, CFLRI).<sup>Custom analysis</sup>
- 12- to 17-year-olds in Canada report spending 0.7 hours per day reading (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 24% of 3- to 4-year-olds in Canada meet the screen time recommendation within the Canadian 24-Hour Movement Guidelines for the Early Years (2009-11, 2012-13 and 2014-15 CHMS, Statistics Canada).<sup>57</sup>
- 3- to 4-year-olds in Canada spend 1.9 hours per day in screen time, according to their parents (2012-13, 2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- In a regional sample of toddlers from Edmonton, Alberta, 15% met the screen time recommendation within the Canadian 24-Hour Movement Guidelines for the Early Years (2014-15 PREPS).<sup>58</sup>
- In a small sample of Canadian children and youth with disabilities (e.g., cerebral palsy, spinal cord injury), approximately 51% report meeting the screen time recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth.<sup>59</sup>

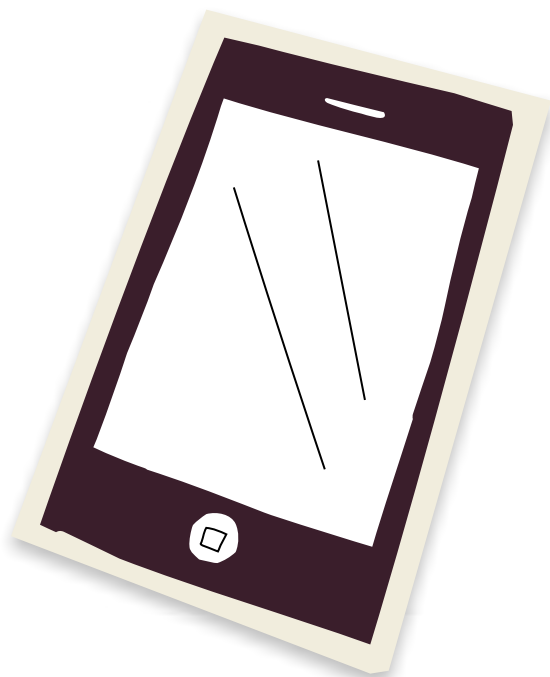
## Research Gaps

- Future research should focus on developing interventions to engage children and youth in regular light-intensity physical activity in place of sedentary behaviour.<sup>171</sup> Children and youth are spending more than half of their day sitting during school hours, and this can be an opportunity to integrate interventions (e.g., standing desks) to reduce sitting time.<sup>172,173</sup>
- More research that differentiates screen (e.g., TV viewing, smartphone use) and non-screen (e.g., reading, colouring) pursuits is needed in order to better understand their independent contributions to sedentary behaviour.<sup>174,175</sup>
- There is a lack of research on sedentary behaviour in infants and toddlers.<sup>176</sup> For example, how much time should infants and toddlers spend in car seats, strollers or high chairs?
- Accelerometers may not be the best tool to capture all forms of sedentary behaviour.<sup>177</sup> More advanced technology such as inclinometers may be more beneficial for measuring sedentary behaviour.<sup>178</sup> Researchers should combine objective measures (e.g., accelerometers/inclinometers) with subjective measures (e.g., self- or proxy-report) to get a more comprehensive measure of sedentary behaviour.
- The validity of sedentary behaviour questionnaires is generally poor to moderate,<sup>179</sup> signalling a need for further validity testing.
- More research is needed on the health consequences of multi-tasking (e.g., using multiple screens simultaneously).
- More research is needed on passive commuting and sitting time at school.



## Recommendations

- From the Canadian Paediatric Society’s Position Statement on Screen Time and Young Children:<sup>180</sup>
  - Watch with children. In doing this, adults can help children connect what is being viewed with real life, and build language and cognitive skills, such as attention, memory and thinking. Shared screen time also avoids the disadvantages of solitary viewing.
  - Actively curate children’s screen activities by prioritizing educational content or apps, avoiding mainstream or commercial programs, and using a media classification rating (e.g., the Canadian Home Video Rating System) to guide viewing choices.
  - Combine touch screen use with creative or active play.
- Parents should develop a family media plan that details where, when and how screens may and may not be used.<sup>180</sup> The American Academy of Pediatrics has released a Family Media Use Plan tool to help with the development of a family media plan. To view the tool, visit [www.healthychildren.org/English/media/Pages/default.aspx](http://www.healthychildren.org/English/media/Pages/default.aspx).
- Parents should remove screens from children’s bedrooms, where they are most likely to lead to reduced sleep.<sup>181</sup>
- Parents should also limit their own screen time to role model for their children.<sup>182</sup>



## Literature Synthesis

Sedentary behaviour refers to any waking behaviour characterized by low energy expenditure ( $\leq 1.5$  metabolic equivalents) while in a sitting, reclining or lying posture.<sup>183</sup> Examples include an infant lying awake in bed with minimal movement, a toddler sitting in a stroller, a preschooler watching TV while seated, a child doing homework while seated and an adolescent playing video games while seated.<sup>183</sup> These behaviours manifest in the early years and childhood, continuing through adolescence into adulthood.<sup>64,184,185,186,187,188,189,190</sup> Interestingly, it was not until the 1980s that researchers started to recognize that prolonged bouts of sitting may have negative impacts on the health of children and youth.<sup>191,192</sup> Since that time, research on the relationship between sedentary behaviours and health has grown exponentially.<sup>189,193</sup> The most current data from Statistics Canada reveal that 5- to 17-year-olds in Canada spend 3.1 hours in recreational daily screen time on average.<sup>54</sup> Preschoolers (3- to 4-year-olds) spend 1.9 hours in daily screen time on average.<sup>57</sup>

A large systematic review of studies involving more than 1.5 million children and youth from 71 countries around the world reveals that different forms of sedentary behaviour may have varying impacts on health.<sup>177</sup> For example, greater durations and frequencies of screen time (e.g., TV viewing, computer use, video game play) are associated with unfavourable body composition, higher scores on indicators of cardiometabolic risk, decreased physical fitness, and lower scores on indicators of emotional and social health (e.g., self-esteem, behavioural conduct/pro-social behaviour, depression, stress, aggression).<sup>173,177,194,195,196,197,198,199,200,201,202,203</sup> Recent research also provides evidence that screen time may have a negative impact on sleep.<sup>204,205,206,207</sup> The use of bright light electronics (e.g., tablets, smartphones) before bedtime may disrupt sleep cycles, and cause shorter sleep durations and delayed bedtimes.<sup>204,208,209</sup> By contrast, other forms of sedentary behaviour may have a different impact on health. Non-screen-based sedentary time (e.g., reading, homework), for example, appears to have a beneficial impact

on academic achievement when done in greater durations.<sup>177</sup> A recent systematic review of research in the early years (0- to 4-year-olds) found preliminary evidence of a similar dichotomy: screen time is sometimes negatively associated with body composition, motor development, cognitive development and indicators of psychosocial health (e.g., self-regulation, pro-social behaviour, aggression), while non-screen-based sedentary time (e.g., reading, storytelling) is sometimes positively associated with cognitive development.<sup>210</sup> Although sedentary behaviour is not entirely avoidable over the course of a day, these findings clearly support the promotion of sedentary behaviour in smaller durations and frequencies, particularly screen time.

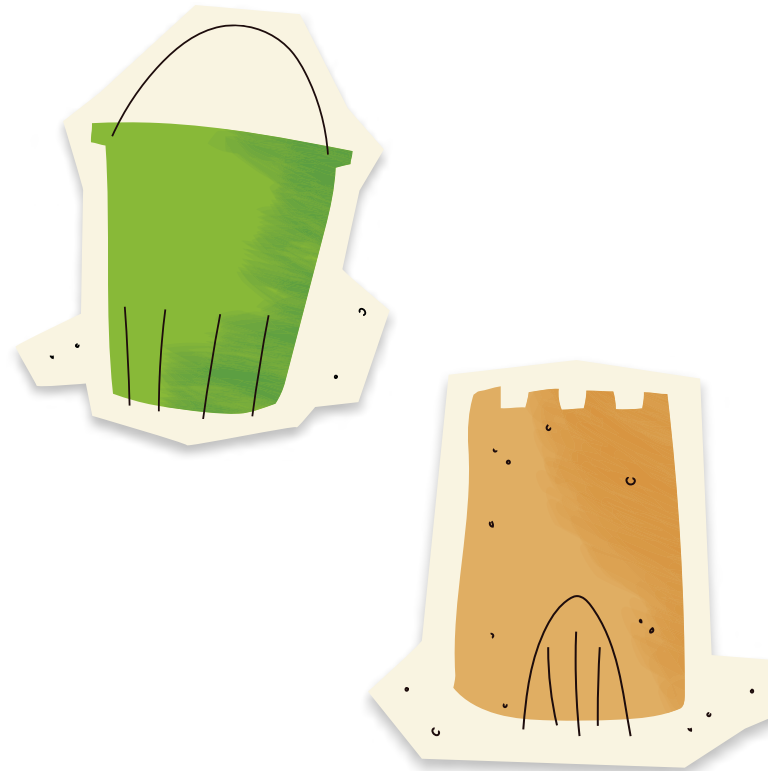
### Using Pedometers to Measure Sedentary Behaviour

Most studies that use objective measures of sedentary behaviour have employed hip-worn accelerometers. However, accelerometers are relatively expensive and, therefore, are not generally available to all teachers, coaches or researchers. By contrast, pedometers are relatively inexpensive; however, historically they have not been able to measure sedentary time. In recent years, some pedometers have moved beyond measuring the number of steps taken per day and now provide a measure of daily total activity time, which includes physical activity at all intensities. Researchers at the University of Prince Edward Island have shown that subtracting total physical activity time from daily wear time provides an estimate of sedentary time that is equivalent to that of hip-worn accelerometers.<sup>211</sup> This new technique offers an inexpensive method for objectively measuring sedentary time among children and youth, which can be used when more costly accelerometers are unavailable.



### Position Statement on Screen Time and Young Children

In late 2017, the Canadian Paediatric Society released the position statement *Screen Time and Young Children: Promoting Health and Development in a Digital World*.<sup>180</sup> The document outlines the potential benefits and risks of screen media exposure in children under 5 years of age, and provides evidence-based recommendations to optimize and support children’s early media experiences.<sup>180</sup> These recommendations involve four principles: minimizing, mitigating, mindfully using and modelling healthy use of screens.<sup>180</sup> To access the Statement, please visit [www.cps.ca/en/documents/position/screen-time-and-young-children](http://www.cps.ca/en/documents/position/screen-time-and-young-children).



**Table 1.** Definitions of key terms from the SBRN Terminology Consensus Project (source: adapted from Tremblay et al, 2017<sup>183</sup>).

Key Term	Definition
<b>Physical inactivity</b>	An insufficient physical activity level to meet present physical activity recommendations.
<b>Stationary behaviour</b>	Stationary behaviour refers to any waking behaviour done while lying, reclining, sitting, or standing, with no ambulation, irrespective of energy expenditure.
<b>Sedentary behaviour</b>	Sedentary behaviour is any waking behaviour characterized by an energy expenditure $\leq 1.5$ metabolic equivalents (METs), while in a sitting, reclining or lying posture.
<b>Standing</b>	A position in which one has or is maintaining an upright position while supported by one’s feet.
<b>Screen time</b>	Screen time refers to the time spent on screen-based behaviours. These behaviours can be performed while being sedentary or physically active.
<b>Non-screen-based sedentary time</b>	Non-screen-based sedentary time refers to the time spent in sedentary behaviours that do not involve the use of screens.
<b>Sitting</b>	A position in which one’s weight is supported by one’s buttocks rather than one’s feet, and in which one’s back is upright.
<b>Reclining</b>	Reclining is a body position between sitting and lying.
<b>Lying</b>	Lying refers to being in a horizontal position on a supporting surface.
<b>Sedentary behaviour pattern</b>	The manner in which sedentary behaviour is accumulated throughout the day or week while awake (e.g., the timing, duration and frequency of sedentary bouts and breaks).

## The Canadian Health Survey on Children and Youth

The Canadian Health Survey on Children and Youth (CHSCY) is a new survey under development at Statistics Canada that is designed to paint a portrait of the health and well-being of Canadian children and youth by collecting information about factors influencing their physical and mental health. The survey covers a broad range of topics that may be useful for future Report Cards, including – but not limited to – the family environment, school, perception of neighbourhood safety, school travel, use of electronic devices, physical activity, sport participation, peer relationships, sleep habits, disabilities, healthcare utilization, etc. The survey underwent a pilot phase in 2017-18 and will start collecting data in 2019.

## Contributing Factors and Disparities

Nationally representative data from Canada (2009-13 CHMS, Statistics Canada) reveal that screen time increases with age: 5- to 11-year-olds average approximately 90 fewer minutes of daily screen time than 12- to 17-year-olds (2.3 hours vs 3.8 hours) and are also much more likely to meet the screen time recommendation within the Canadian 24-Hour Movement Behaviour Guidelines for Children and Youth (71% vs. 28%).<sup>54</sup> There are also sex-related disparities: boys spend approximately 30 more minutes in daily screen time compared to girls (3.3 hours vs. 2.8 hours) on average and, among 12- to 17-year-olds, boys are less likely to meet the screen time recommendation (24% vs. 33%).<sup>54</sup> Preschoolers (3- to 4-year-olds) spend 1.9 hours in screen time per day on average, and there are no differences between boys and girls.<sup>57</sup>



GRADE

# B+ Sleep

**This year's grade is a B+**, which represents a slight improvement from the B assigned in 2016. Based on a proportional weighting of new data on preschoolers (2/15 years, 13% of total) and school-aged children and youth (13/15 years, 87% of total), approximately three quarters of preschoolers and school-aged children and youth meet their age-specific sleep recommendations.

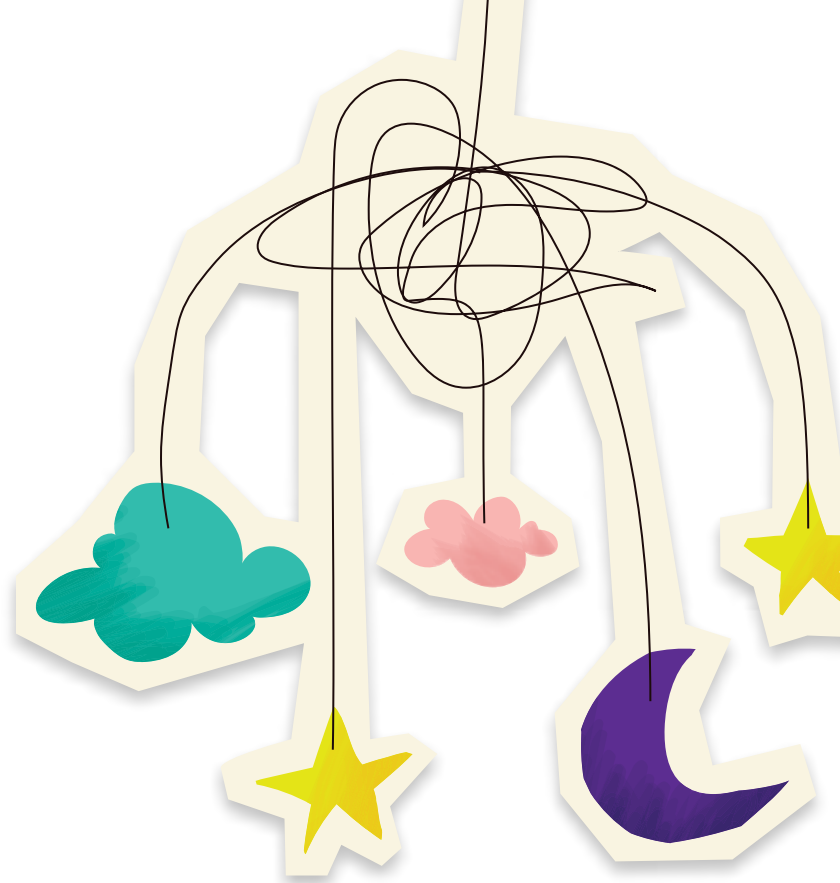
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018
Grade	-	-	-	-	-	-	-	-	-	-	-	B	B+
Benchmark	<ul style="list-style-type: none"> <li>Percentage of children and youth who meet the sleep recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth (5- to 13-year-olds: 9-11 hours per night; 14- to 17-year-olds: 8-10 hours per night).<sup>52</sup></li> <li>Percentage of preschoolers who meet the sleep recommendation within the Canadian 24-Hour Movement Guidelines for the Early Years (3- to 4-year-olds: 10-13 hours per night).<sup>53</sup></li> </ul>												
Grading Scheme	A+ 94-100%		B+ 74-79%		C+ 54-59%		D+ 34-39%						F 0-19%
	A 87-93%		B 67-73%		C 47-53%		D 27-33%						
	A- 80-86%		B- 60-66%		C- 40-46%		D- 20-26%						





## Key Findings

- Approximately three quarters of school-aged children and youth in Canada meet the sleep recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth.<sup>52</sup>
  - 74% of 5- to 17-year-olds (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
  - 75% of 5- to 17-year-olds (2009-11, 2012-13 CHMS, Statistics Canada).<sup>54</sup>
- Sleep duration in Canadian children and youth is approximately 8-9 hours per night:
  - 5- to 11-year-olds are asleep for 9.7 hours, according to their parents (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
  - 12- to 17-year-olds are asleep for 8.2 hours, based on self-report (2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 33% of 5- to 13-year-olds in Canada, and 45% of 14- to 17-year-olds, have trouble going to sleep or staying asleep, at least some of the time (2012-13 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 96% of 6- to 13-year-olds in Canada, and 83% of 14- to 17-year-olds, find their sleep refreshing at least some of the time (2012-13 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 12% of 5- to 13-year-olds in Canada, and 36% of 14- to 17-year-olds, find it difficult to stay awake during their normal waking hours when they want to, at least some of the time (2012-13 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- 84% of 3- to 4-year-olds in Canada meet the sleep recommendation of 10-13 hours of sleep per night on average (2009-11, 2012-13, 2014-15 CHMS, Statistics Canada).<sup>57</sup>
  - Preschoolers are asleep for 10.6 hours per night, according to their parents (2012-13, 2014-15 CHMS, Statistics Canada).<sup>Custom analysis</sup>
- In a regional sample of toddlers from Edmonton, 82% met the sleep recommendation within the 24-hour Movement Guidelines (2014-15 PREPS).<sup>58</sup>



## Research Gaps

- Only self- or proxy-reports are used for surveillance of sleep in Canada. Objective measures are needed to better assess sleep health of Canadians. The key characteristics of sleep health are sleep duration, sleep quality, sleep timing, sleep duration variability and sleep hygiene. Of note, sleep will be monitored using accelerometry in future cycles of the CHMS.
- Sleep questions for use in population health surveys should be updated to reflect new research. They should also be evidence-informed, validated and, ideally, harmonized for use around the world to facilitate comparisons across countries.
- More research on napping as it relates to sleep and health outcomes is needed for young children. Napping is generally not included in national surveys but is part of the Canadian 24-Hour Movement Guidelines for the Early Years.<sup>53</sup>
- Research that can better inform the sleep consistency piece of the Canadian 24-Hour Movement Guidelines for the Early Years is needed. The specific surveillance recommendation is that bedtime and wake-up times should not vary by more than  $\pm 30$  minutes each, including on weekends. However, this is not supported by robust evidence and work needs to be done to better support this specific surveillance recommendation.

## Recommendations

- Ensure children go to bed and wake up at consistent times that allow them to obtain age-appropriate amounts of sleep.
- Establish consistent bedtime routines.
- Limit access to electronics (e.g., cellphones, tablets, computers, TVs) during and after bedtime by removing these devices from children's bedrooms.
- Delay school start times for adolescents – even by as little as 30 minutes – as a countermeasure to chronic sleep deprivation.
- We should all take sleep more seriously in our busy, work-obsessed society instead of viewing it as a waste of time. Not only is a good night's sleep as important as eating well and being physically active for overall health, but sleeping habits also impact eating and physical activity behaviours in a way that complicates the maintenance of a healthy active lifestyle.



## Literature Synthesis

Sleep is essential for healthy cognitive, psychosocial and physical health in the early years<sup>213</sup> and in school-aged children and youth.<sup>214</sup> Healthy sleep requires adequate duration, good quality, appropriate timing, consistency and the absence of sleep disorders.<sup>215</sup> However, insufficient sleep has become the norm in modern societies with the constant availability of commodities and technologies.<sup>216,217,218</sup> Children and youth sleep less now compared to decades ago.<sup>219,220</sup> Adolescents have shown a steeper decline in sleep duration over the past decades compared with younger children or adults, especially on school days.<sup>220</sup> Factors explaining sleep loss in adolescents include excessive screen time associated with blue light exposure, consumption of wake-promoting substances such as energy drinks, lack of parental monitoring, and overscheduling (e.g., extracurricular activities, homework, after-school employment, social activities).<sup>221</sup> More importantly, it is physiologically normal for adolescents to go to bed later (they have a phase delay of up to two hours relative to middle childhood),<sup>222</sup> so it helps explain why few of them meet the sleep duration recommendations on school days. Later school start times – even as little as a 10-minute delay – are associated with longer sleep durations in Canadian adolescents.<sup>223</sup>

An accumulating body of evidence shows that insufficient sleep poses a serious threat to academic success, health and safety of children and youth, and is an important public health issue that needs to be addressed.<sup>215,221</sup> The systematic reviews that helped inform the Canadian 24-Hour Movement Guidelines for the Early Years<sup>213</sup> and the Canadian 24-Hour Movement Guidelines for Children and Youth<sup>214</sup> reveal that short sleep duration is associated with excess body weight, poorer emotional regulation, impaired growth, poorer academic achievement, more screen time, higher risk of injuries and lower quality of life/well-being. Many other adverse effects of insufficient sleep during childhood have been documented in the literature, including hyperactivity, impulsiveness, anxiety, depressive symptoms and suicidality.<sup>224</sup> It is hoped that the Canadian 24-Hour Movement Guidelines will bring more attention and resources to sleep as a key component of a healthy childhood.

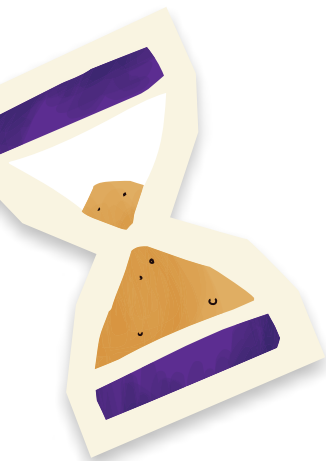
It is also important to note that sleep is associated with other movement behaviours such as physical activity and sedentary behaviour.<sup>225</sup> For example, aerobic physical activity improves sleep quality.<sup>226</sup> Screen time before bedtime has been shown to disrupt sleep<sup>204</sup> and can decrease physical activity for some children and youth.<sup>227</sup> Finally, insufficient sleep can reduce physical activity levels due to increased fatigue<sup>228</sup> and is associated with more screen time in children.<sup>229</sup> As a result, the Canadian 24-Hour Movement Guidelines highlight the important interconnections between sleep, sedentary behaviour and physical activity. Canadians should understand that the whole day matters for optimal health,<sup>230</sup> not only being physically active and eating well. The more healthy behaviours people can integrate and tolerate in their day, the better it is for their health – and they all matter.

**Table 2.** Sleep duration recommendations (source: Canadian Society for Exercise Physiology<sup>52,53</sup>).

Age group	Recommendation
<b>Newborns (0-3 months)</b>	14 to 17 hours per day (including naps)
<b>Infants (4-11 months)</b>	12 to 16 hours per day (including naps)
<b>Toddlers (1-2 years)</b>	11 to 14 hours per day (including naps, with consistent bedtimes and wake-up times)
<b>Preschoolers (3-4 years)</b>	10 to 13 hours per day (which may include a nap and consistent bedtimes and wake-up times)
<b>Children (5-13 years)</b>	9 to 11 hours per night (with consistent bedtimes and wake-up times)
<b>Youth (14-17 years)</b>	8 to 10 hours per night (with consistent bedtimes and wake-up times)

### A Good Night's Sleep is Vital for Child and Youth Brain Health

A good night's sleep is a fundamental component of both mental and physical functioning. Considering the current pervasiveness of sleep restriction in young people, especially adolescents, and the need for optimal mental capacities in everyday life, it is not surprising that questions concerning sleep and the brain – neurocognitive functioning specifically – have become an important topic in recent years. According to recent systematic reviews, poor sleep quality, short sleep duration and variability in sleep timing negatively impact attention, memory, reasoning, emotional regulation, behaviours and sensory perception in children and youth.<sup>231,232,233</sup> This evidence can be observed in children as early as the preschool years<sup>233</sup> all the way through adolescence.<sup>5,231</sup> The relationships between poor sleep and various cognitive functions are important since they may have serious implications on behaviour and impact the academic performance of children and youth.



## Contributing Factors and Disparities

Based on 2009-11 and 2012-13 CHMS data, there are no sex-related differences in sleep duration among school-age children and youth; however, age-related disparities exist: a higher proportion (83%) of 5- to 11-year-olds meet the sleep recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth compared to 12- to 17-year-olds (68%).<sup>54</sup> As it relates to trends over time, data from the United States reveal that declines in sleep duration over the past several years have been more pronounced in girls, racial/ethnic minorities and those from low socio-economic backgrounds.<sup>218</sup> Whether this is also the case in Canada is currently unclear. However, recent data in Canadian adults show that those with higher household education and income were more likely to report sleeping the recommended number of hours per night by comparison to those with less education and lower incomes.<sup>234</sup>

**Figure 9.** General tips for having healthy sleep hygiene (source: Chaput 2016<sup>229</sup>).



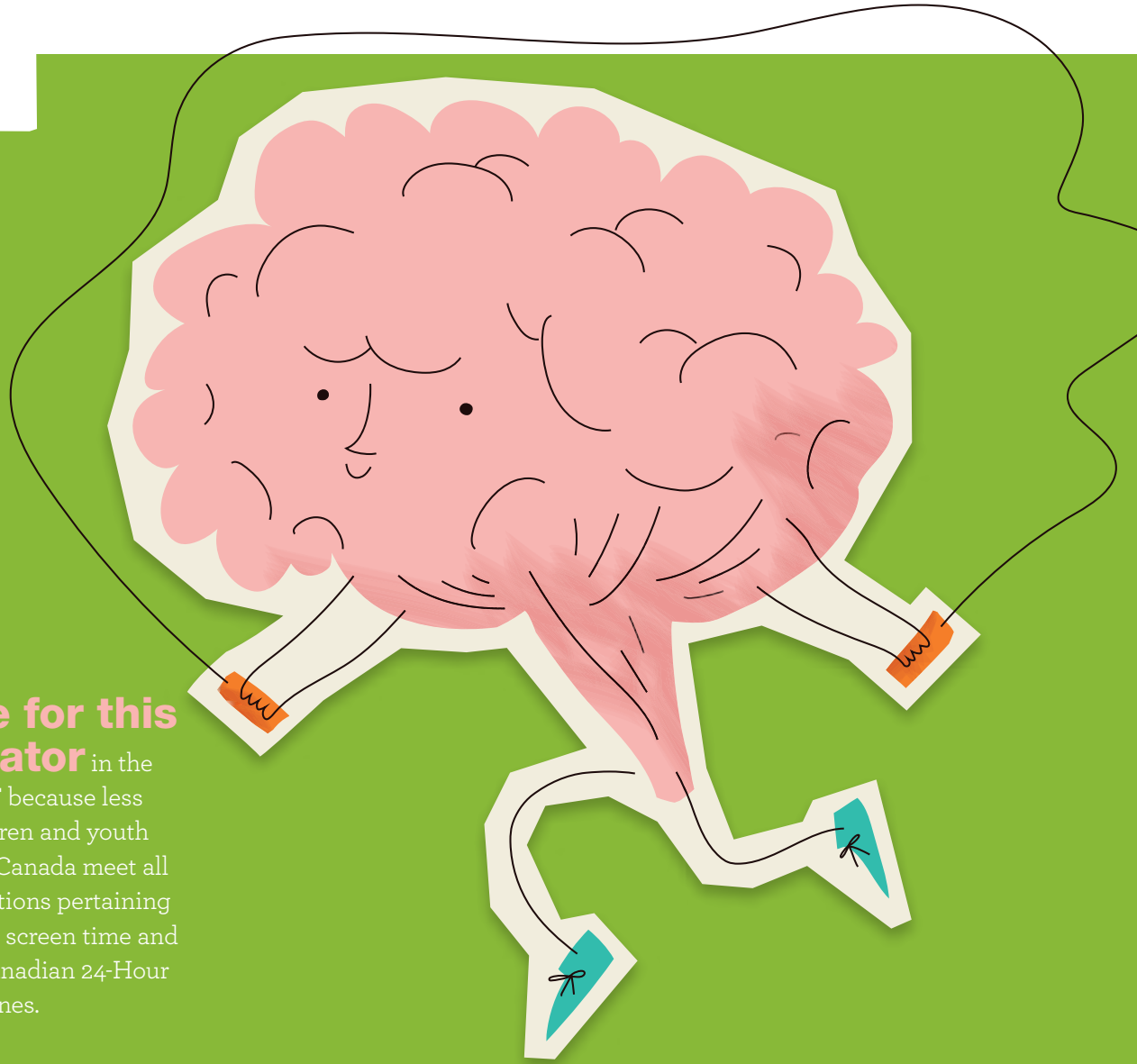
### General Tips for Having Healthy Sleep Hygiene

- 1** **Go to bed and wake up at the same time** every day (even on the weekends!)
- 2** **Avoid caffeine consumption** (e.g., coffee, soft drinks, chocolate) starting in the late afternoon
- 3** **Expose yourself to bright light in the morning** – sunlight helps the biological clock to reset itself each day
- 4** **Make sure your bedroom is conducive to sleep** – it should be dark, quiet, comfortable, and cool
- 5** **Sleep on a comfortable mattress and pillow**
- 6** **Don't go to bed feeling hungry,** but also don't eat a heavy meal right before bed
- 7** **Develop a relaxing routine** before bedtime – ideas include bathing, music, and reading
- 8** **Reserve your bedroom for sleeping only** – no cell phones, computers, video games and televisions in your bedroom
- 9** **Exercise regularly during the day**
- 10** **Don't have pets in your bedroom**

**GRADE**

**F**

# 24-Hour Movement Behaviours



**The grade for this new indicator** in the

Report Card is an F because less than a fifth of children and youth or preschoolers in Canada meet all three recommendations pertaining to physical activity, screen time and sleep within the Canadian 24-Hour Movement Guidelines.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018
Grade	-	-	-	-	-	-	-	-	-	-	-	-	F
Benchmark	<ul style="list-style-type: none"> <li>Percentage of children and youth who meet the physical activity, screen time and sleep recommendations within the Canadian 24-Hour Movement Behaviour Guidelines for Children and Youth.<sup>52</sup></li> <li>Percentage of preschoolers who meet the physical activity, screen time and sleep recommendations within the Canadian 24-Hour Movement Behaviour Guidelines for the Early Years.<sup>53</sup></li> </ul>												
Grading Scheme	A+ 94-100%		B+ 74-79%		C+ 54-59%		D+ 34-39%		F 0-19%				
	A 87-93%		B 67-73%		C 47-53%		D 27-33%						
	A- 80-86%		B- 60-66%		C- 40-46%		D- 20-26%						

## Key Findings

- ✿ A little less than a fifth of children and youth in Canada meet all three recommendations within the Canadian 24-Hour Movement Guidelines for Children and Youth:
  - ✿ 15% of 5- to 17-year-olds (2014-15 CHMS, Statistics Canada)<sup>Custom analysis</sup>
  - ✿ 18% of 5- to 17-year-olds (2009-13 CHMS, Statistics Canada)<sup>54</sup>
  - ✿ 37% meet two out of three recommendations.<sup>54</sup>
- ✿ 13% of 3- to 4-year-olds in Canada meet all three recommendations within the Canadian 24-Hour Movement Guidelines for the Early Years (2009-15 CHMS, Statistics Canada).<sup>57</sup>
  - ✿ A high proportion of 3- to 4-year-olds in Canada meet the physical activity (62%) and sleep (84%) recommendations, but only 24% meet the screen time recommendation.<sup>57</sup>
- ✿ In a regional sample of toddlers from Edmonton, 12% met all three recommendations within the Canadian 24-Hour Movement Guidelines for the Early Years (2014-15 PREPS).<sup>58</sup>
- ✿ In a small sample of Canadian children and youth with disabilities (e.g., cerebral palsy, spinal cord injury), approximately 14% report meeting all three recommendations within the Canadian 24-Hour Movement Guidelines for Children and Youth.<sup>59</sup>

## Research Gaps

- ✿ Research is needed that examines the impact of combinations of movement behaviours on health indicators over time.<sup>235</sup>
- ✿ Research is needed that examines intermediate combinations of movement behaviours (e.g., high physical activity + high sleep + low sedentary behaviour vs. low physical activity + high sleep + low sedentary behaviour).<sup>235</sup>
- ✿ Research is needed that further divides light physical activity into low and high, or measures sedentary behaviour with alternative devices, such as inclinometers that better classify postures, in order to examine if associations with health indicators differ.<sup>235</sup>

## Recommendations

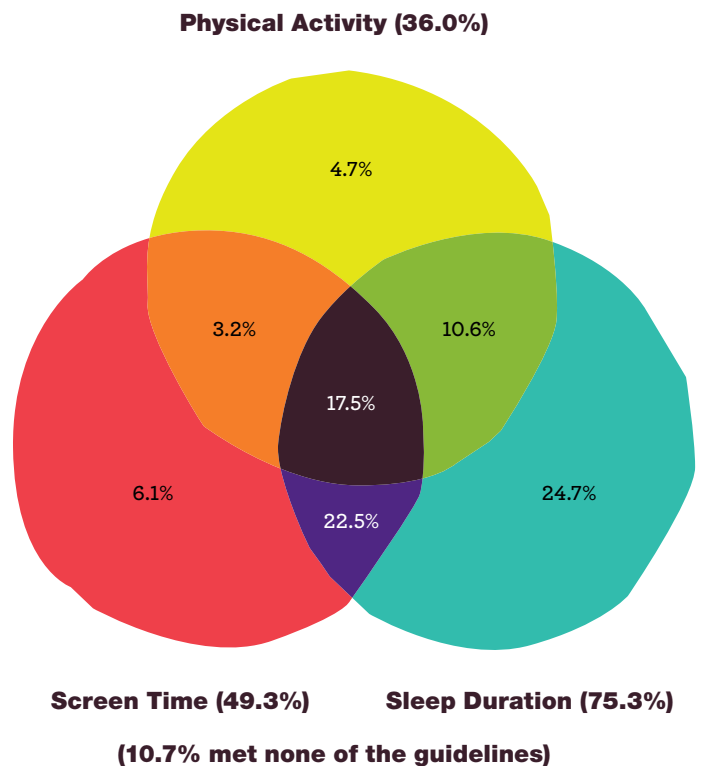
- ✿ It is important for parents, teachers and clinicians to recognize that a child's or youth's level of physical activity, sedentary behaviour and sleep all contribute to their overall health and well-being. Even if they are meeting the physical activity recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth,<sup>52</sup> they are still likely to benefit from meeting the sedentary behaviour and sleep recommendations.
- ✿ Preserving sufficient sleep, trading indoor time for outdoor time and replacing sedentary behaviours and light physical activity with additional MVPA can provide greater health benefits.<sup>52</sup>



## Literature Synthesis

The health benefits of physical activity – particularly MVPA – in children and youth are well established (see *Why Is Physical Activity Important?* on page 6). However, MVPA is only one of several movement behaviours (light-intensity physical activity, MVPA, sedentary behaviour, sleep) that children and youth engage in over a 24-hour period. In time-use terms, MVPA accounts for a very small portion of the day (about 5%) whereas light-intensity physical activity, sedentary behaviour and sleep account for the other 95% of the day (Figure 10).<sup>230</sup> This, in combination with the independent health benefits of high levels of physical activity, low levels of sedentary behaviour and sufficient levels of sleep, has led to the emergence of research on the health benefits of different combinations of the movement behaviours.<sup>5</sup>

A recent systematic review of studies that examined combinations of movement behaviours and their relationship to health outcomes found that children and youth with high levels of physical activity/sleep and low levels of sedentary behaviour tend to have more favourable measures of health (e.g., lower waist circumference and blood pressure) compared to those with low levels of physical activity/sleep and high levels of sedentary behaviour.<sup>5</sup> Children and youth with favourable levels of two out of three movement behaviours (e.g., high physical activity/sleep, high physical activity/low sedentary behaviour) are more likely to have favourable health benefits compared to their counterparts (e.g., low physical activity/sleep, low physical activity/high sedentary behaviour).<sup>5</sup> Among the three movement behaviours, physical activity – particularly MVPA – is most consistently linked to health benefits.<sup>5</sup> Currently, studies examining combinations of movement behaviours in relation to health outcomes are few and of low quality.<sup>5</sup> More research is required before stronger conclusions can be drawn. A recent systematic review of movement behaviours in the early years reveals similar results: high levels of physical activity and low levels of sedentary behaviour are associated with favourable motor development and fitness in preschoolers.<sup>236</sup> However, as with research in school-aged children and youth, more research and higher-quality studies are needed.<sup>236</sup>



**Figure 10.** Venn diagram illustrating the proportion of 5- to 17-year-olds in Canada meeting various combinations of recommendations within the Canadian 24-Hour Movement Behaviour Guidelines for Children and Youth (source: Roberts et al, 2017<sup>54</sup>).

### Canadian 24-Hour Movement Guidelines for the Early Years (0-4 Years): An Integration of Physical Activity Sedentary Behaviour, and Sleep

Released in November 2017, the Canadian 24-Hour Movement Guidelines for the Early Years (Figure 11) combine recommendations for physical activity, sedentary behaviour and sleep, highlighting the interrelationship between all three behaviours. These Guidelines were developed by the Canadian Society for Exercise Physiology; HALO-CHEO; the Faculty of Kinesiology, Sport, and Recreation at the University of Alberta; PHAC; ParticipACTION; and a group of leading researchers from Canada and around the world, with input from more than 600 national and international stakeholders.

## Guidelines Preamble

These Guidelines are relevant to all apparently healthy infants (less than 1 year), toddlers (1-2 years), and preschoolers (3-4 years), irrespective of gender, cultural background, or the socio-economic status of the family. These Guidelines may be appropriate for young children with a disability or medical condition; however, a health professional should be consulted for additional guidance.

To encourage healthy growth and development, young children should receive support from their parents and caregivers that allows for an active lifestyle with a daily balance of physical activities, sedentary behaviours, and sleep. Young children should participate in a range of developmentally appropriate, enjoyable, and safe play-based and organized physical activities in a variety of environments (e.g., home/childcare/school/community; indoors/outdoors; land/water; summer/winter), both independently as well as together with adults and other children. For infants, supervised activities could include tummy time, reaching and grasping, pushing and pulling, and crawling. The quality of sedentary behaviour matters; for example, interactive non-screen-based behaviours (e.g., reading, storytelling, singing, puzzles) are encouraged. Developing healthy sleep hygiene in the early years is important; this includes having a calming bedtime routine with consistent bedtimes and wake-up times, avoiding screen time before sleep, and keeping screens out of the bedroom.

Following these Guidelines through the early years is associated with better growth, cardiorespiratory and musculoskeletal fitness, cognitive development, psychosocial health/emotional regulation, motor development, body composition, quality of life/well-being, as well as reduced injuries. The benefits of following these Guidelines exceed potential harms.

For those not currently meeting these 24-Hour Movement Guidelines, a progressive adjustment toward them is recommended. Adhering to these Guidelines may be challenging at times; resources are available for assistance at [www.BuildYourBestDay.com/EarlyYears](http://www.BuildYourBestDay.com/EarlyYears).

These Guidelines were informed by the best available evidence, expert consensus, stakeholder consultation, and consideration of values and preferences, applicability, feasibility, and equity. The specific Guidelines and more details on the background research, their interpretation, guidance on how to achieve them, and recommendations for further research and surveillance are available at [www.csep.ca/guidelines](http://www.csep.ca/guidelines).

## Contributing Factors and Disparities

There are age- and sex-related disparities in the proportion of Canadian children and youth meeting all recommendations within the Canadian 24-Hour Movement Guidelines for Children and Youth: 30% of 5- to 11-year-olds vs. 6% of 12- to 17-year-olds, and 23% of boys vs. 12% girls, meet all three recommendations.<sup>54</sup>



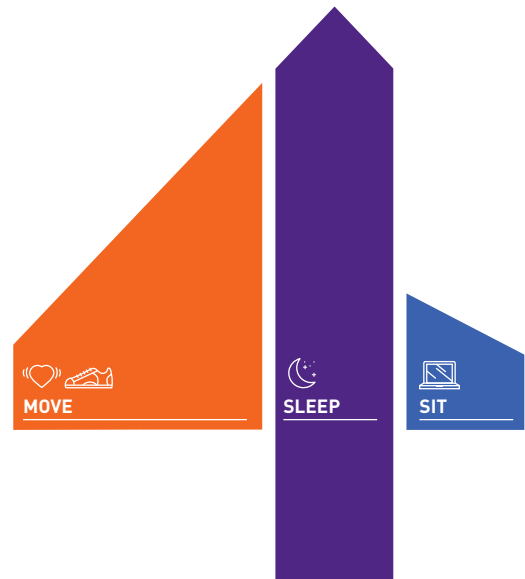
**Figure 11.** (Next page) The Canadian 24-Hour Movement Guidelines for the Early Years (0-4 Years): An Integration of Physical Activity, Sedentary Behaviour, and Sleep (source: Canadian Society for Exercise Physiology<sup>55</sup>).



# Canadian 24-Hour Movement Guidelines for the Early Years (0-4 years)

For healthy growth and development, infants, toddlers, and preschoolers should achieve the recommended balance of physical activity, high-quality sedentary behaviour, and sufficient sleep.

A healthy 24 hours includes:



## MOVE

### INFANTS (LESS THAN 1 YEAR)

Being physically active several times in a variety of ways, particularly through interactive floor-based play—more is better. For those not yet mobile, this includes at least 30 minutes of tummy time spread throughout the day while awake.

## SLEEP

14 to 17 hours (for those aged 0-3 months) or 12 to 16 hours (for those aged 4-11 months) of good-quality sleep, including naps.

## SIT

Not being restrained for more than 1 hour at a time (e.g., in a stroller or high chair). Screen time is not recommended. When sedentary, engaging in pursuits such as reading and storytelling with a caregiver is encouraged.

### TODDLERS (1-2 YEARS)

At least 180 minutes spent in a variety of physical activities at any intensity, including energetic play, spread throughout the day—more is better.

11 to 14 hours of good-quality sleep, including naps, with consistent bedtimes and wake-up times.

Not being restrained for more than 1 hour at a time (e.g., in a stroller or high chair) or sitting for extended periods. For those younger than 2 years, sedentary screen time is not recommended. For those aged 2 years, sedentary screen time should be no more than 1 hour—less is better. When sedentary, engaging in pursuits such as reading and storytelling with a caregiver is encouraged.

### PRESCHOOLERS (3-4 YEARS)

At least 180 minutes spent in a variety of physical activities spread throughout the day, of which at least 60 minutes is energetic play—more is better.

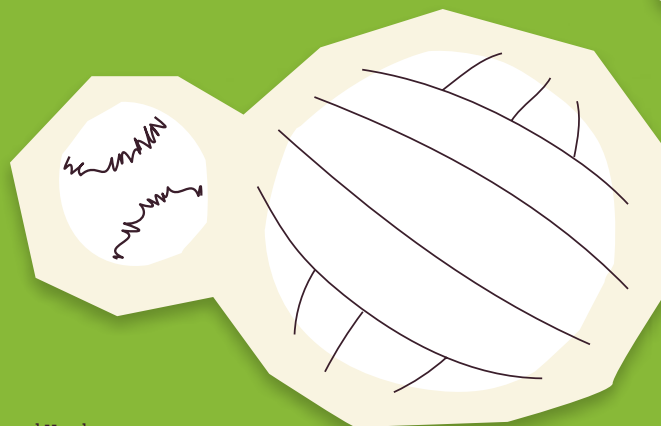
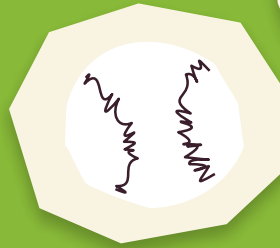
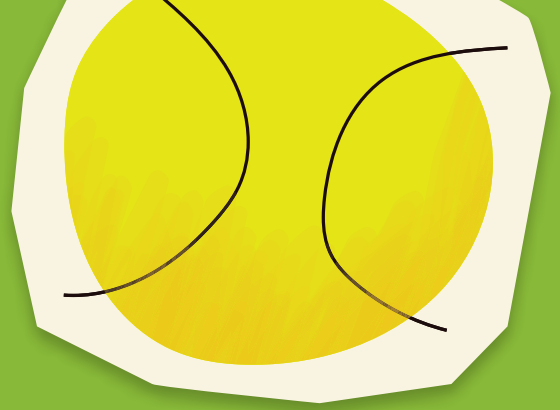
10 to 13 hours of good-quality sleep, which may include a nap, with consistent bedtimes and wake-up times.

Not being restrained for more than 1 hour at a time (e.g., in a stroller or car seat) or sitting for extended periods. Sedentary screen time should be no more than 1 hour—less is better. When sedentary, engaging in pursuits such as reading and storytelling with a caregiver is encouraged.

Replacing time restrained or sedentary screen time with additional energetic play, and trading indoor for outdoor time, while preserving sufficient sleep, can provide greater health benefits.

REPORT CARD INDICATORS:

# Individual Characteristics



**GRADE**

# D+

## Physical Literacy

**This year's grade remains a D+**

because available data suggest that slightly less than half of children in Canada are meeting the recommended levels of physical literacy.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018	
Grade	–	–	–	–	–	–	–	–	–	–	INC	D+	D+	
Benchmark	* Percentage of children and youth who meet the recommended levels of physical competence, knowledge and understanding, motivation and confidence and daily behaviours needed for a physically active lifestyle.													
Grading Scheme	A+ 94-100%				B+ 74-79%			C+ 54-59%			D+ 34-39%			
	A 87-93%				B 67-73%			C 47-53%			D 27-33%			F 0-19%
	A- 80-86%				B- 60-66%			C- 40-46%			D- 20-26%			



## Key Findings

- 36% of 8- to 12-year-olds in Canada assessed by the Canadian Assessment of Physical Literacy (CAPL) meet or exceed the minimum level recommended for physical literacy (2014-17 CAPL, HALO):<sup>237</sup>
- 37% meet or exceed the minimum level recommended for the physical competence domain of physical literacy.
- 29% meet or exceed the minimum level recommended for the daily behaviour domain of physical literacy.
- 34% meet or exceed the minimum level recommended for the motivation and confidence domain of physical literacy.
- 39% meet or exceed the minimum level recommended for the knowledge and understanding domain of physical literacy.
- **Note: if readers are aware of or have access to physical literacy data that would help to inform this grade, please contact ParticipACTION ([info@participaction.com](mailto:info@participaction.com)).**

## Research Gaps

- More research is needed, specifically longitudinal study designs, to reveal and understand how physical literacy evolves as children develop into adolescents and young adults.
- Longitudinal research should examine the influence of childhood physical literacy on adult health outcomes to better quantify its long-term impact.
- Future studies using consistent methodologies are needed to study trends in physical literacy over time, and in different geographical locations.
- A greater understanding of the key correlates that affect a child's physical literacy over time is needed to help policymakers and practitioners effectively inform their PE and/or physical literacy programs.
- Policy efforts to increase physical literacy need to be evaluated (e.g., new active play standards in British Columbia, which stipulate that fundamental movement skills must be incorporated into active play activities within licensed daycare programs<sup>238</sup>).



## Recommendations

- Widely communicate Canada's Physical Literacy Consensus Statement<sup>239</sup> in order to enhance the overall understanding of physical literacy and each of its elements.
- Provide school administrators with easy-to-use physical literacy toolkits that can be integrated into their PE curricula, and support the use of these toolkits.
- Consider policy changes to programs, particularly in the education system, so that practitioners are able to identify, intervene and support children with low levels of physical literacy.
- Investigate and share information on best practices for improving physical literacy in children and youth.

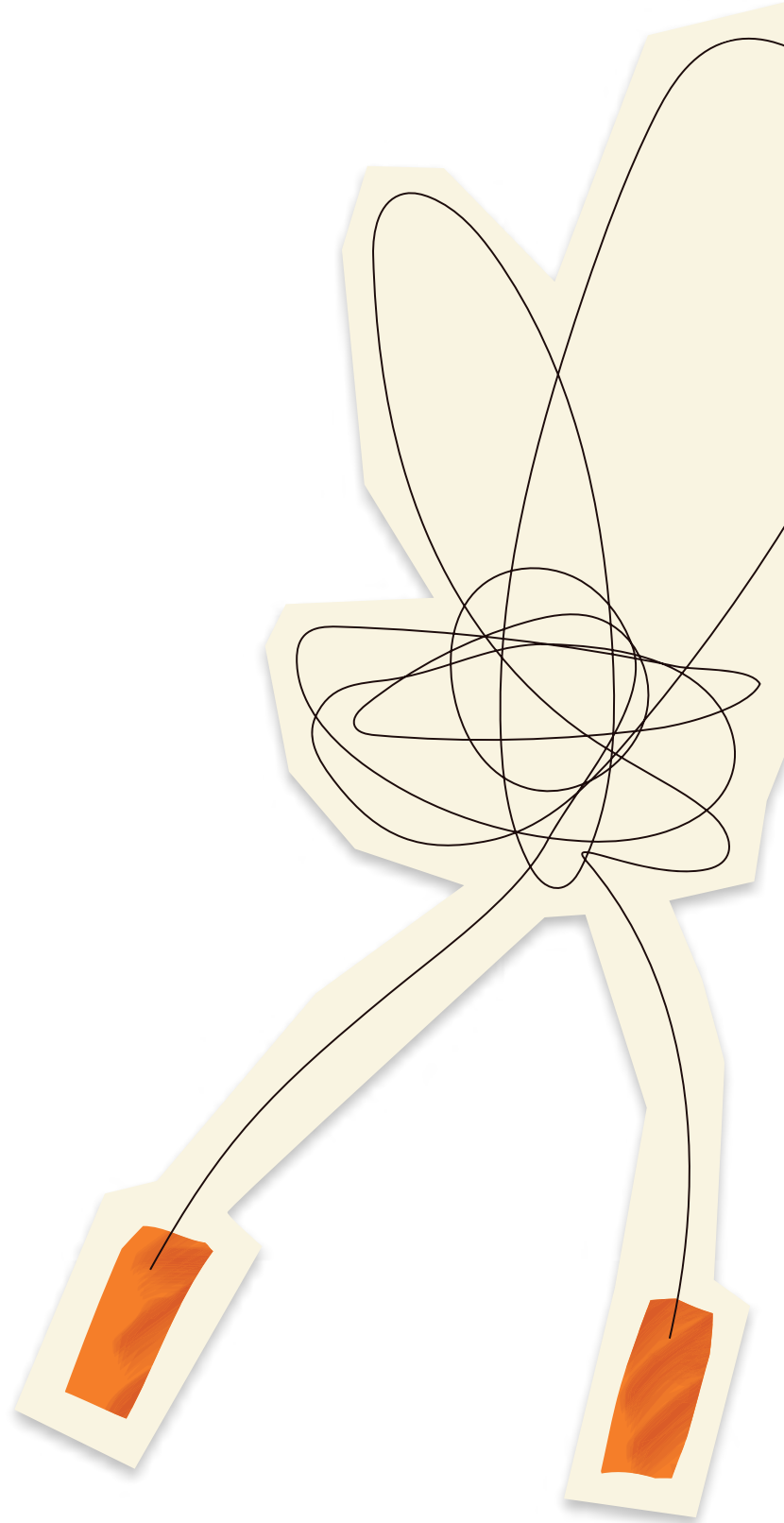
## Literature Synthesis

Physical literacy, as a term, has been around since the early 1900s;<sup>240</sup> only in recent years, however, has it become widely used.<sup>240</sup> According to the International Physical Literacy Association, physical literacy is “the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life.”<sup>241</sup> The release of Canada's Physical Literacy Consensus Statement<sup>239</sup> in 2015 at the Vancouver International Physical Literacy Conference marks the general acceptance and adoption of this definition in Canada.<sup>240,242,243</sup>

Physical literacy is a component of physical and health education curricula in Canadian schools, and there are currently three predominant assessment tools available in Canada:

- **Passport for Life** by Physical & Health Education (PHE) Canada: [www.passportforlife.ca](http://www.passportforlife.ca)
- **Physical Literacy Assessment for Youth (PLAY)** by Canadian Sport 4 Life (CS4L): [play.physicalliteracy.ca](http://play.physicalliteracy.ca)
- **Canadian Assessment of Physical Literacy, 2nd Edition (CAPL-2)** by HALO: [www.capl-eclp.ca](http://www.capl-eclp.ca)

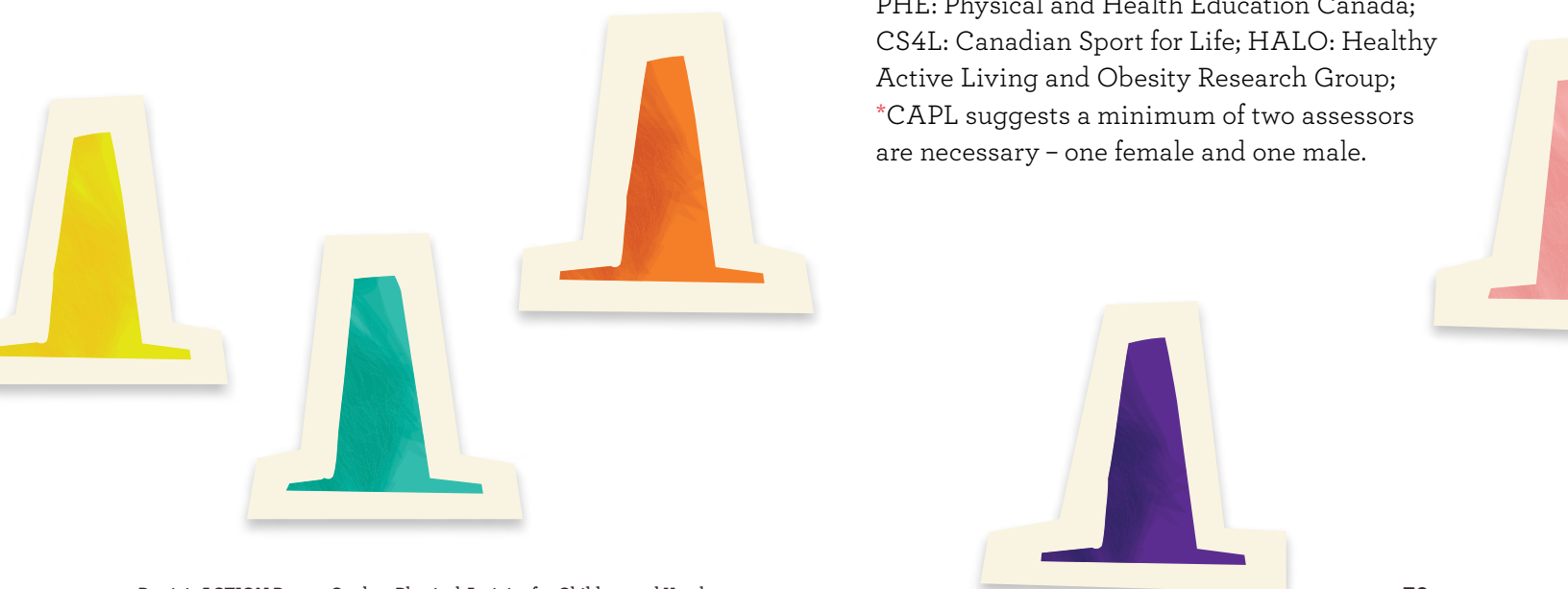
Reliability and validity evidence for several of these tools continues to be published in the research literature.<sup>244,245,246</sup> A recent comparison of physical literacy assessment tools in Canada provides a summary of their similarities and differences (Table 3).



**Table 3.** A comparison of the predominant physical literacy assessment tools in Canada (source: adapted from Robinson and Randall, 2017<sup>243</sup>).

Assessment tool	Passport for Life	PLAY (PLAYfun)	CAPL-1
<b>Organization</b>	PHE Canada	CS4L	HALO
<b>Ages/grades</b>	Grades 3-12	Ages 7+	Ages 8-12
<b>Applications</b>	Formative assessment in (physical) education; engagement and awareness	Program evaluation and research; formative assessment, screening, surveillance, engagement	Advocacy, monitoring and evaluation; surveillance
<b>Assessment categories</b>	Fitness skills, movement skills, active participation, living skills	Competence, comprehension, and confidence (related to 18 movement tasks)	Physical competence (32%), daily behaviour (32%), knowledge and understanding (18%), motivation and confidence (18%)
<b>Assessment measures</b>	Objective measures (using four-staged rubrics) for fitness skills and movement skills; self-reports for active participation (without performance measures) and living skills (using four-staged rubrics)	Objective measures (using two- and four-staged rubrics) for competence and comprehension; objective measures (using an analytic rating scale) for confidence	Objective measures (using four-staged rubrics) for physical competence (based on a battery of fitness assessments and anthropometric measurements), daily behaviour (based on daily step count and self-reported moderate to vigorous physical activity [MVPA] and sedentary time); self-reports for knowledge and understanding and motivation and confidence (based on questionnaire responses)
<b>Performance descriptors</b>	Fitness skills, movement skills, and living skills: performance is labelled as “Emerging,” “Developing,” “Acquired,” or “Accomplished” Active participation: performance is not measured but information related to diverse activities and environment is summarized	Competence: performance is labelled as “Developing” (which includes “Initial”—0 to 25% and “Emerging”—25 to 50%) or “Acquired” (which includes “Competent”—50 to 75% and “Proficient”—75 to 100%) Comprehension: performance is labelled as “Prompt,” “Mimic,” “Describe,” or “Demo” Confidence: performance is labelled as low, medium, or high	Physical competence, daily behaviour, knowledge and understanding, motivation and confidence: performance is labelled as “Beginning,” “Progressing,” “Achieving,” or “Excelling”
<b>Assessment time (for one assessor with one class)</b>	Three class periods	Undefined (estimated to be at least four class periods)	Four class periods
<b>Assessment materials</b>	Activity space (e.g., gymnasium); balls and cones, computers with internet access	Activity space (e.g., gymnasium); balls, cones, and sticks	Activity space (e.g., gymnasium); balls and cones; anthropometric tools (e.g., scale, measuring tape, calipers)
<b>Targeted assessors</b>	Physical education teacher or generalist teacher	Trained professionals (e.g., sport and recreation practitioners, physical education teachers)	Physical activity professionals, CAPL trainer appraisers, physical education teachers*

PHE: Physical and Health Education Canada; CS4L: Canadian Sport for Life; HALO: Healthy Active Living and Obesity Research Group; \*CAPL suggests a minimum of two assessors are necessary – one female and one male.



Data on the physical literacy levels of children in Canada are becoming increasingly available in the peer-reviewed literature. A supplemental issue with 14 papers from the Royal Bank of Canada Learn to Play – Canadian Assessment of Physical Literacy study (RBC – Learn to Play CAPL) will be published in *BMC Public Health* later this year. These papers examined the four domains (physical competence, daily behaviour, motivation and confidence, knowledge and understanding) of physical literacy in 8- to 12-year-old Canadians and reported a number of findings, including the following:

- The physical competence and the motivation and confidence domains are negatively related to screen-based sedentary time (e.g., TV time, computer time), non-screen-based sedentary time (e.g., reading, homework) and total sedentary time.<sup>247</sup> For example, as physical competence increases, time spent being sedentary tends to decrease. The knowledge and understanding domain is also negatively related to screen-based sedentary time, but positively related to non-screen-based sedentary time.
- Data from RBC – Learn to Play CAPL reveal that the relative age effect appears to have a negligible impact on physical literacy scores, meaning that children with earlier birthdays in a given year do not perform substantially better or worse than those with birthdays later in the year.<sup>248</sup>
- Healthy levels of cardiorespiratory fitness in 8- to 12-year-olds, as estimated from performance results on the 20-metre shuttle run test, are positively related to all domains of physical literacy, particularly physical competence, and motivation and confidence.<sup>249</sup>
- Children with physical competence, and motivation and confidence, scores meeting or exceeding the minimum recommendations are more likely to meet the physical activity and recreational screen time recommendations within the Canadian 24-Hour Movement Guidelines for Children and Youth.<sup>250</sup> However, the knowledge and understanding domain of physical literacy does not appear to be related to physical activity or screen time guideline adherence in 8- to 12-year-olds.<sup>250</sup>

Normative physical literacy data will also be available in this supplemental issue that provide baseline scores for physical literacy and its domains, which researchers and practitioners can use for comparisons with their own data.<sup>237</sup>

Other data in Canada related to physical literacy reveal that fundamental movement skills (e.g., running, kicking, throwing, balancing) are positively related to health: 9- to 12-year-olds with greater fundamental movement skill scores, as assessed by Passport for Life and PLAY Basic tools, have more favourable levels on health indicators such as body weight, body mass index, waist circumference, percent body fat, handgrip strength and cardiorespiratory fitness.<sup>251</sup> Similar results have been seen outside Canada. For example, in a sample of 6- to 11-year-olds in the United States, those with greater motor competence were more likely to accumulate more daily MVPA and have a lower body mass index than those with lower motor competence.<sup>252</sup>

## Contributing Factors and Disparities

Based on data from approximately 10,000 children aged 8 to 12 years from seven provinces across Canada (2014-17 CAPL, HALO), there are small sex-related disparities in physical literacy: boys tend to have slightly higher physical literacy (63.2 vs. 62.3 out of 100), physical competence (20.0 vs. 19.4 out of 32), daily behaviour (18.6 vs. 18.5 out of 32) and motivation and confidence scores (12.7 vs. 12.2 out of 18), while girls tend to have slightly higher knowledge and understanding scores (12.2 vs. 11.8 out of 18).<sup>237</sup> The differences, however, are small enough that they should be considered unimportant. In the 2016 Report Card,<sup>71</sup> these disparities were larger than they are now. This change reflects an update to the CAPL scoring system and is not indicative of any changes in sex-related disparities over the last two years.

**GRADE**

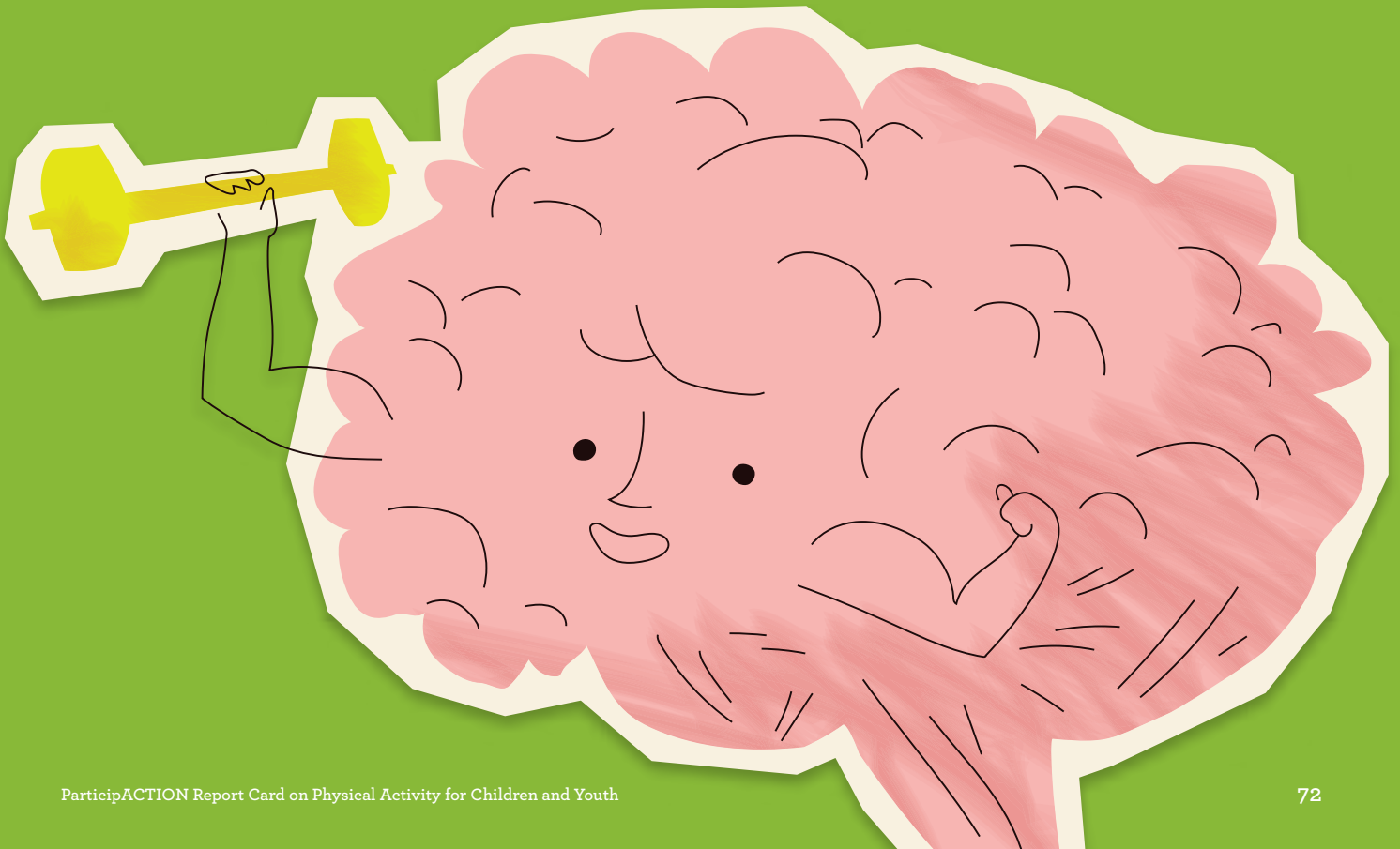
# D

## Physical Fitness

### The benchmarks for this new indicator relate to cardiorespiratory fitness,

muscular strength and endurance, and flexibility. This year's grade is a D based on available cardiorespiratory fitness data. Although muscular strength and endurance, and flexibility data are available, a lack of evidence-based benchmarks prevent these data from informing the grade.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018
Grade	—	—	—	—	—	—	—	—	—	—	—	—	D
Benchmark	<ul style="list-style-type: none"> <li>• Average percentile of cardiorespiratory fitness achieved based on age- and sex-specific international normative data.<sup>253</sup></li> <li>• Percentage of children and youth who meet criterion-referenced standards for muscular strength.</li> <li>• Percentage of children and youth who meet criterion-referenced standards for muscular endurance.</li> <li>• Percentage of children and youth who meet criterion-referenced standards for flexibility.</li> </ul>												
Grading Scheme	A+ 94-100%			B+ 74-79%			C+ 54-59%			D+ 34-39%			
	A 87-93%			B 67-73%			C 47-53%			D 27-33%			F 0-19%
	A- 80-86%			B- 60-66%			C- 40-46%			D- 20-26%			





## Key Findings

- 9- to 12-year-olds in Canada are at the 28th percentile, on average, for cardiorespiratory fitness (shuttle run in 20-metre laps) based on age- and sex-specific international normative data<sup>253</sup> (2014-17 CAPL, HALO).<sup>Custom analysis</sup>

## Research Gaps

- More research is needed to inform age- and sex-specific cut-points for healthy cardiorespiratory fitness in children and youth.<sup>256</sup>
- There are currently no agreed-upon cut-points for healthy muscular endurance or flexibility in this age group, which should be addressed by future research.
- More research is needed to better understand why physical fitness varies internationally.<sup>254</sup>
- More information is required on the physical fitness of priority population groups such as Indigenous children and youth.

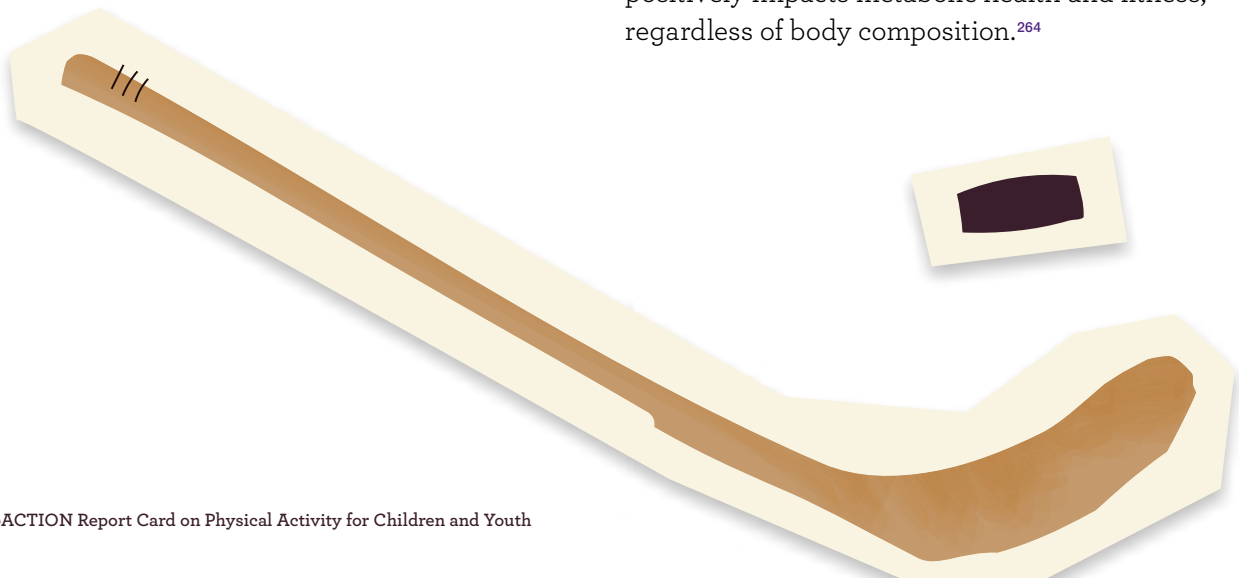
## Recommendations

- Given the strong link between cardiorespiratory fitness and health in children and youth independent of physical activity, and the feasibility for measurement of cardiorespiratory fitness in large studies, cardiorespiratory fitness would be a valuable addition to Canada's physical activity surveillance systems.<sup>256</sup>
- Practitioners should include a focus on increasing cardiorespiratory fitness in physical activity programming for children and youth.
- Efforts to include cardiorespiratory fitness as a "vital sign" routinely examined in primary care should be promoted.

## Literature Synthesis

Physical fitness is a broad term that refers to an individual's capacity to dynamically move about their environment, and the ability of their cardiovascular, respiratory and muscular systems to sustain physical activity over a prolonged period of time.<sup>255</sup> Collectively, physical fitness is a strong predictor of current and future overall health.<sup>256,257,258</sup> For example, adults with lower levels of physical fitness have a higher risk of all-cause mortality (i.e., death from any cause) and disease-related mortality,<sup>259</sup> and children with low physical fitness are at an increased risk of developing cardiovascular and metabolic-related diseases in adulthood.<sup>257</sup> In support of this, a recent meta-analysis that included more than 9,000 children and youth revealed that those with low cardiorespiratory fitness have a nearly 600% greater risk of developing cardiovascular disease compared to their peers with higher levels of cardiorespiratory fitness.<sup>255</sup> Children with higher fitness levels have lower adiposity, reduced risk of developing metabolic syndrome and better bone health compared to children with lower physical fitness.<sup>258,260,261,262</sup> As well, children with high physical fitness have a reduced risk of depression and anxiety, as well as reduced stress levels.<sup>177,261</sup>

Participation in regular physical activity can increase physical fitness,<sup>2,76,256,263</sup> and children and youth with the lowest levels of physical fitness stand to gain the greatest health improvements by increasing their physical activity.<sup>263</sup> For example, as little as 30 minutes of daily MVPA is associated with higher fitness and better metabolic health in obese children and youth, suggesting that regular physical activity positively impacts metabolic health and fitness, regardless of body composition.<sup>264</sup>



### Cardiorespiratory Fitness

Among the various components of physical fitness (e.g., musculoskeletal fitness, motor fitness), cardiorespiratory fitness – the body’s ability to supply oxygen to the muscles during physical activity<sup>265</sup> – has received considerable attention in the research literature. An analysis of 137 studies representing just under one million 9- to 17-year-olds from 19 countries found that between 1981 and 2004, cardiorespiratory fitness declined by approximately 7%, stabilizing around the turn of the century.<sup>266</sup> Another analysis that compared cardiorespiratory fitness data on over one million children and youth from 50 countries revealed that Canadian children and youth are in the middle of the pack (19/50; Figure 12).<sup>267</sup> These findings are particularly concerning given that cardiorespiratory fitness is strongly related to current and future health in children and youth.<sup>256</sup>

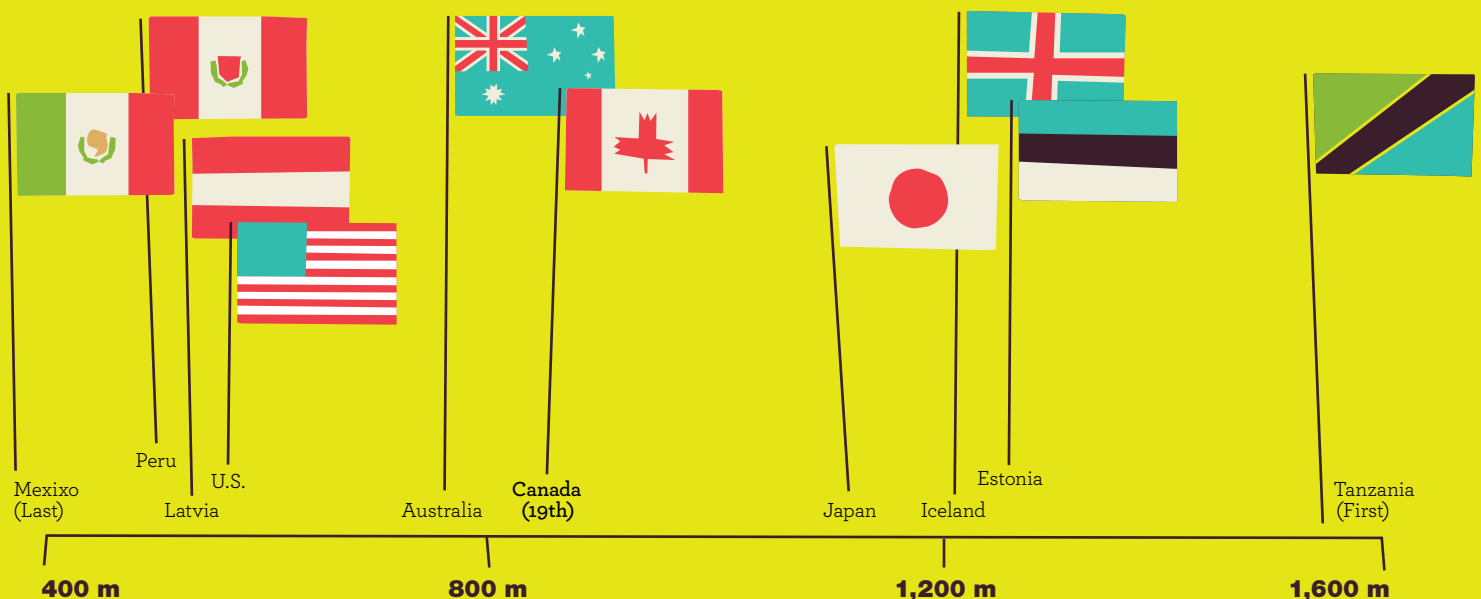
**Figure 12.** The distance in metres run by 9- to 17-year-olds, from different countries, on the 20-metre shuttle run test (source: adapted from Lang et al, 2018<sup>267</sup>).

### Muscular Strength and Endurance, and Flexibility

Available data reveal that 57% of 8- to 12-year-olds in Canada have maximum grip strength values at or above the 50th percentile based on nationally representative reference values<sup>268</sup> (2014-17 CAPL, HALO).<sup>Custom analysis</sup> 92% of 8- to 12-year-olds have a value at or above the 5th percentile, which has been proposed as a cut-point for abnormally low grip strength<sup>268</sup> (2014-17 CAPL, HALO).<sup>Custom analysis</sup> Based on plank test performance (measured in seconds), 8- to 12-year-old boys have average and median values of 62.4 and 51.0 seconds, respectively while girls have average and median values of 61.3 and 50.7 seconds, respectively (2014-17 CAPL, HALO).<sup>Custom analysis</sup> Based on sit-and-reach test performance (measured in centimetres), 8- to 12-year-old girls have average and median values of 30.9 and 31.5 cm, respectively while boys have average and median values of 25.4 and 26.0 cm, respectively (2014-17 CAPL, HALO).<sup>Custom analysis</sup>

### World’s Fittest Kids

Here’s a comparison of how 1 million kids between the ages of 9 and 17 from 50 countries performed in a 20 m shuttle run test (adapted from The Globe and Mail, 2016, [www.theglobeandmail.com/life/health-and-fitness/fitness/canadian-children-finish-19th-in-study-of-the-beep-fitness-test/article31985138](http://www.theglobeandmail.com/life/health-and-fitness/fitness/canadian-children-finish-19th-in-study-of-the-beep-fitness-test/article31985138)).



### Physical Fitness Builds Better Brains

The developing brain of children and youth is strongly impacted by physical fitness. Several studies have shown that children and youth with higher physical fitness have larger brain volume,<sup>31,269,270</sup> and the neural networks that facilitate cognitive function display more efficient processing.<sup>26</sup> A growing collection of research has also found that physical fitness has a positive impact on academic performance as well as on the cognitive functions that underlie scholastic achievement.<sup>29,271,272,273</sup> In fact, a recent study demonstrated that children with higher physical fitness have better cognitive function compared to their less fit peers.<sup>274</sup> Importantly, increasing a child’s fitness through participation in regular physical activity appears to improve cognitive function – it’s never too late to boost brain power!<sup>273</sup>

### Contributing Factors and Disparities

Based on data from the 2014-17 CAPL dataset, the small age- and sex-related disparities in 20-metre shuttle run performance among 9- to 12-year-olds in Canada are negligible: average percentiles for cardiorespiratory fitness based on age- and sex-specific international normative data<sup>253</sup> are mostly in the 20-30th percentile range (Figure 13).

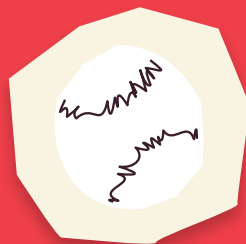
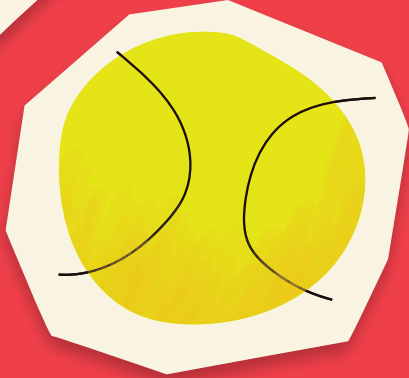
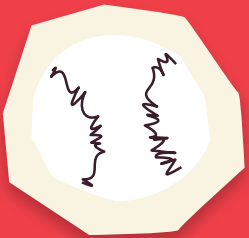


**Figure 13.** Average percentile for cardiorespiratory fitness among 9- to 12-year-olds in Canada based on age- and sex-specific international normative data<sup>253</sup> (source: 2014-17 CAPL, HALO<sup>249</sup>).



REPORT CARD INDICATORS:

# Settings & Sources of Influence



# GRADE

# C+

## Family & Peers

### The benchmarks for this indicator relate to family physical activity and peer influence.

Since a lack of gradable data continues for peer influence, the grade is informed only by family physical activity data. This year's grade is a C+ for the third time in a row. New data continue to show that parents are supportive of child and youth physical activity. However, data on parental role modelling of physical activity is less encouraging and prevents the grade from moving into the B range.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018
Family Physical Activity Grade													
Grade	D/C-*	D-/D/D*	D	D/B*	C+	D	D+	D+	C	C	C+	C+	C+
Peer Influence Grade													
	—	—	—	—	INC	INC	INC	INC	INC				

- Benchmark
- Percentage of parents who facilitate physical activity and sport opportunities for their children (e.g., volunteering, coaching, driving, paying for membership fees and equipment).
  - Percentage of parents who meet the Canadian Physical Activity Guidelines for Adults.<sup>275</sup>
  - Percentage of parents who are physically active with their kids.
  - Percentage of children and youth with friends and peers who encourage and support them to be physically active.
  - Percentage of children and youth who encourage and support their friends to be physically active.

\* In 2005, there were two separate indicators: Family Physical Activity and Ensuring Kids are Active. In 2006, there were three separate indicators: Family Physical Activity, Ensuring Kids are Active, and Parent Perspectives on Activity. In 2008, there were again two separate indicators: Family Perceptions & Roles Regarding Physical Activity, and Ensuring Kids are Active.

Grading Scheme	A+ 94-100%	B+ 74-79%	C+ 54-59%	D+ 34-39%	
	A 87-93%	B 67-73%	C 47-53%	D 27-33%	F 0-19%
	A- 80-86%	B- 60-66%	C- 40-46%	D- 20-26%	

## Key Findings

- 92% of students in grades 9 to 12 in Alberta, British Columbia, Nunavut, Ontario and Quebec report having parents/step-parents/guardians who support them in being physically active (2016-17 COMPASS, University of Waterloo).<sup>Custom analysis</sup>
- 73% of students in grades 9 to 12 in Alberta, British Columbia, Nunavut, Ontario and Quebec report having parents/step-parents/guardians who encourage them to be physically active (2016-17 COMPASS, University of Waterloo).<sup>Custom analysis</sup>
- 32% of 18- to 39-year-olds and 18% of 40- to 59-year-olds in Canada meet the Canadian Physical Activity Guidelines for Adults, which recommend at least 150 minutes of weekly MVPA (2012-13 CHMS, Statistics Canada).<sup>276</sup>
- 36% of parents in Canada with 5- to 17-year-olds report playing active games with them (based on a subsample of the 2014-15 Physical Activity Monitor [PAM], CFLRI).<sup>Custom analysis</sup>
- In a nationally representative sample of more than 1,300 biological parent-child pairs, every 20-minute increase in parental MVPA was associated with a 5- to 10-minute increase in the MVPA of their 6- to 11-year-old child, independent of parental support for physical activity (2007-13 CHMS, Statistics Canada).<sup>146</sup>
- Among students in grades 9 to 12 in Ontario and Alberta, for each additional physically active friend they had, adherence to the physical activity recommendation (at least 60 minutes of daily MVPA) within the Canadian 24-Hour Movement Behaviour Guidelines for Children and Youth<sup>52</sup> increased by 6%.<sup>277</sup>
- Among students in grades 5 to 12 in Prince Edward Island (2014-15 SHAPES-PEI).<sup>Custom analysis</sup>
  - 92% report that their parents/guardians are supportive or very supportive (e.g., equipment purchases, transportation to team games) of their physical activity.
  - 82% report that their parents/guardians encourage or strongly encourage them to be physically active.
  - 42% and 48% report that their mother and father, respectively, are physically active.
  - 95% report that they have at least one close friend who is physically active.

## Research Gaps

- More research is needed to identify how peer and family influences develop and change throughout the course of childhood and adolescence, which, in turn, may help determine how to prevent the decline in physical activity as children enter adolescence.
- Intervention research using a multidisciplinary approach to increase physical activity in children and youth should consider complementing their designs with a peer-support or peer-modelling component.
- Further research is needed to determine whether peer influence has more impact on structured physical activities (e.g., organized sports, gym class enrollment and participation) or unstructured physical activities (e.g., active outdoor play).
- Research is needed on age-specific, effective intervention strategies that enhance supportive relationships through both family and peer networks.
- More research is needed that addresses how to overcome previously identified, parent-related barriers to facilitating physical activity in children and youth.



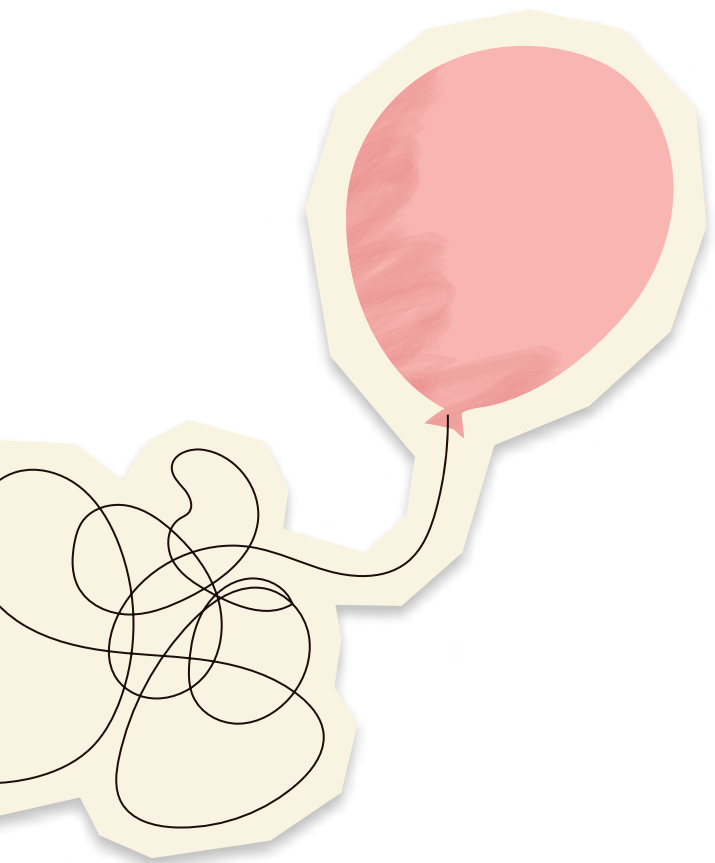
## Recommendations

- ✿ Encourage children and youth to find active games and/or sports that they enjoy doing with friends since this could help offset the drop-off in the number of active peers as children age.
- ✿ Encourage older children and youth to mentor and facilitate physical activity for younger children. Positive physical activity modelling from older children may help contribute to younger children engaging in a physically active lifestyle.
- ✿ Provide better support to programs and opportunities geared toward the entire family being physically active in their communities.
- ✿ Encourage families to be physically active together.
- ✿ Encourage parents to participate in active play with their children of all ages. Finding time to participate with their children, and being an active role model, will support a culture of physical activity in the home.
- ✿ Identify and train potential champions or physical activity leaders in the student body at schools who can promote and model positive physical activity.

## Literature Synthesis

Physical activity correlates are factors associated with physical activity such as age, sex, sport participation and access to physical activity facilities.<sup>278</sup> While there is a large body of research on physical activity correlates in children and youth at various levels (e.g., individual, interpersonal, environmental), relatively less data are available at the social level (e.g., parental support, peer influences, independent mobility, sibling co-participation).<sup>277,279</sup> A systematic review of available research on social correlates concluded that parental support (e.g., encouragement, enrolment in sport, transportation) and having a companion for physical activity are associated with higher levels of physical activity in children and youth, whereas parental role modelling of physical activity appears unrelated to physical activity.<sup>280</sup> There is also evidence from studies of grade 5 students in London, Ontario, that parental support is related to child perceptions of that parental support, which, in turn, are positively associated with child physical activity.<sup>281,282</sup>

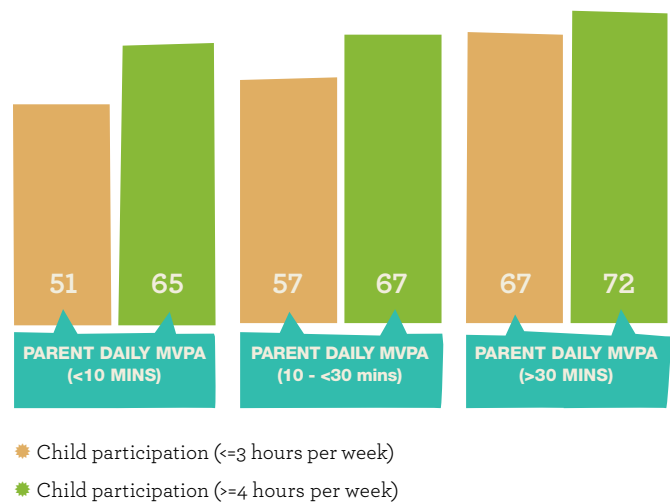
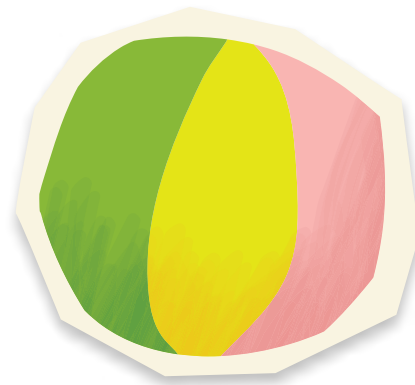
Parental support has a positive impact on child physical activity (6- to 11-year-olds who participate in lessons or league/team sports for 2-3 hours, 4-6 hours and 7+ hours per week get an additional 6, 12 and 11 minutes of daily MVPA, respectively, compared to their peers who never participate in lessons or league/team sports<sup>146</sup>). Recently published national data confirm this positive impact, but challenge the conclusion that parental role modelling is not associated with physical activity in children. In a nationally representative sample of more than 1,300 biological parent-child pairs, every 20-minute increase in parental MVPA was associated with a 5- to 10-minute increase in the MVPA of their 6- to 11-year-old child – independent of parental support for physical activity (Figure 14).<sup>146</sup> A study out of Edmonton also found that for every 1,000-step increase in parental physical activity, the daily physical activity of 7- to 8-year-olds increased by 260 steps, lending further support for a positive relationship between parental role modelling and child physical activity.<sup>283</sup> There is also evidence abroad in support of the importance of parental role modelling.<sup>284</sup>



### Influence of Peers on Physical Activity

Research on peer influence continues to grow, and evidence reveals that having physically active peers may increase children’s/youth’s physical activity<sup>285</sup> and even help to reduce screen time.<sup>286</sup> A longitudinal study of nearly 23,000 students in grades 9 to 12 from Ontario and Alberta helps to quantify the impact that peers can have on physical activity: for each additional physically active friend, adherence to the physical activity recommendation (at least 60 minutes of daily MVPA on average) within the Canadian 24-Hour Movement Behaviour Guidelines for Children and Youth<sup>52</sup> increased by 6% (2012-15 COMPASS, University of Waterloo).<sup>277</sup> A recent study in Australia involving younger participants (11- to 13-year-olds) showed similar results: boys with more friends and a greater proportion of male friends were more likely to engage in more MVPA outside of school hours; girls were more likely to engage in higher-intensity physical activity during recess and/or lunchtime when they reported having more friends who played sports.<sup>287</sup> Research also shows that these associations extend to younger children, including preschoolers.<sup>288,289,290</sup> Interactions with a group of peers outside of one’s network (e.g., sports teams) may also help with the development of a variety of personal and social skills, including empathy, loyalty, self-control and conflict resolution.<sup>16</sup>

It is possible that negative peer experiences (e.g., bullying) have detrimental effects on movement behaviours and health. Research from the 2012-13 COMPASS study reveals that females with overweight/obesity reported an additional 34 minutes of daily screen time, 2 minutes of which is attributable to peer victimization.<sup>291</sup> A similar relationship was seen in males (13 additional minutes of daily screen time, 1 minute of which is attributable to peer victimization).<sup>291</sup> However, the lower levels of MVPA reported were not associated with negative peer experiences.<sup>291</sup>



**Figure 14.** Average daily minutes of MVPA among 6- to 11-year-olds in Canada, by participation in lessons or league or team sports and biological parent MVPA (source: 2007-09, 2009-11, 2012-13 CHMS, Statistics Canada<sup>146</sup>).

### Influence of Siblings on Physical Activity

Recent studies shed some light on the influence of siblings on physical activity and sedentary behaviours: sibling co-participation in physical activity did not appear to be associated with physical activity outside of school on weekdays in Spanish students in grades 4, 7 and 10.<sup>279</sup> In a British study involving younger children (3- to 4-year-olds), having at least one older sibling was associated with several fewer minutes of sedentary time per hour, possibly the result of an older role model or just having someone to play with and, therefore, displacing sedentary time with active play.<sup>292</sup>



### Evaluation of ParticipACTION's "Make Room for Play" Campaign

In 2015, ParticipACTION launched the "Make Room for Play" campaign,<sup>293</sup> which involved running TV and online ads from January to March to raise awareness of the link between increased screen time and decreased active play in childhood. For example, the playground ad can be viewed on YouTube: [www.youtube.com/watch?v=Lk-AdtffkpTc](http://www.youtube.com/watch?v=Lk-AdtffkpTc). Based on a survey of more than 1,500 parents, 46% and 26% were able to recall the ads with and without prompts, respectively.<sup>294</sup> A greater proportion of parents who recalled the ads (57%) reported engaging in forms of parental support (e.g., plan when kids could be active, enforce screen time rules) compared to parents who did not recall the ads (44%).<sup>294</sup> This evaluation provides evidence that mass-media physical activity campaigns such as "Make Room for Play" may have a role to play in promoting the importance of active play in children.<sup>294</sup>

### Contributing Factors and Disparities

Some evidence exists of a sex-related disparity for the influence of parental role-modelling on child (6- to 11-year-olds) physical activity, although the associations are similar regardless of the sex of the parent, with physical activity associations in parent-daughter pairs tending to be stronger than in parent-son pairs.<sup>146</sup> There may also be an age-related disparity in relation to both family and peer influence. For example, the number of friends that high school students in Ontario and Alberta consider to be physically active tends to decrease with age (2012-15 COMPASS, University of Waterloo).<sup>277</sup> In a longitudinal study in England that explored perceived barriers to participation in extracurricular sports, 9-year-olds identified barriers primarily related to parental involvement (e.g., parental permission, transportation).<sup>295</sup> However, three years later these same children perceived their friends' lack of involvement as a barrier to participation.<sup>295</sup> There is also evidence that co-participation in physical activity with family and friends (e.g., active transportation) contributes more to non-school physical activity in youth than in children.<sup>279</sup>



## GRADE

# B- School

**The benchmarks for this indicator relate to** physical education and physical activity opportunities at school and in childcare settings, as well as school policy and programming, and school infrastructure and equipment. This indicator focuses on structural factors in contrast to individual physical activity behaviours within the school setting, which are the focus of the Physical Education indicator (see page 46). This year's grade is a B-, which represents a slight decline from the B assigned in 2016. While available data on physical education and school infrastructure are encouraging, the proportion of schools in Canada with partially implemented physical activity-related policies prevents the assignment of a higher grade this year.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018
Physical Education & Physical Activity Participation at School & in Childcare Settings													
Grade	F/INC*	-/INC*	-/C*	-/C*	C-/B*	C-/C*	C-/B*	C/B*	C				
School Policy & Programming Grade													
	-/INC**	-/INC**	-/C**	-/C**	C/B**	C/C**	C/B**	C-/B**	C	C+	C+	B	B-
School Infrastructure & Equipment Grade													
	-	-	-	INC	B	B	B	B+	B+				

- Benchmark
- Percentage of schools with active school policies (e.g., daily PE, DPA, recess, “everyone plays” approach, bike racks at school, traffic calming on school property, outdoor time).
  - Percentage of schools where the majority (≥ 80%) of students are taught by a PE specialist.
  - Percentage of schools where the majority (≥ 80%) of students are offered at least 150 minutes of PE per week.
  - Percentage of schools that offer physical activity opportunities (excluding PE) to the majority (≥ 80%) of their students.
  - Percentage of parents who report their children and youth have access to physical activity opportunities at school in addition to PE classes.
  - Percentage of schools with students who have regular access to facilities and equipment that support physical activity (e.g., gymnasium, outdoor playgrounds, sporting fields, multipurpose space for physical activity, equipment in good condition).

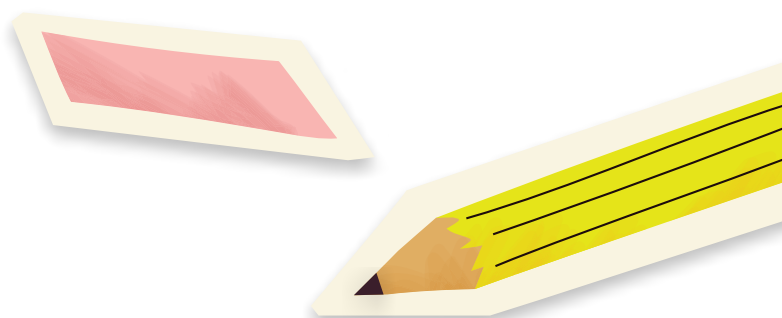
\* From 2005 to 2012, there were two separate indicators: Physical Education and Sport & Physical Activity Opportunities at School. In 2013, these indicators were collapsed into a single indicator.

\*\* From 2009 to 2012, there were two separate indicators: School Policy and Sport & Physical Activity Opportunities at School. In 2013, these indicators were collapsed into a single indicator.

Grading Scheme	A+ 94-100%	B+ 74-79%	C+ 54-59%	D+ 34-39%	F 0-19%
	A 87-93%	B 67-73%	C 47-53%	D 27-33%	
	A- 80-86%	B- 60-66%	C- 40-46%	D- 20-26%	

## Key Findings

- ✿ 48% of school administrators in Canada report having a fully implemented policy to provide daily physical education to all students (2015 OPASS, CFLRI).<sup>296</sup>
- ✿ 46% of school administrators in Canada report having a fully implemented policy to provide mandated DPA to all students (2015 OPASS, CFLRI).<sup>296</sup>
- ✿ 39% of school administrators in Canada indicate that they are concerned about liability, which may cause the school to limit the kinds of physical activity in which students can participate (2015 OPASS, CFLRI).<sup>Custom analysis</sup>
- ✿ 74% of school administrators in Canada report that they use a PE specialist to teach PE in their school. 44% of schools indicate that they use a teacher who has at least one elective credit in PE (2015 OPASS, CFLRI).<sup>297</sup>
- ✿ Of those who indicate that their school uses a PE specialist, 16% indicate that less than half of students receive PE directly from this individual, 19% of schools indicate that many or most of their students receive PE from this specialist and 65% indicate that almost all students receive PE instruction from a specialist (2015 OPASS, CFLRI).<sup>Custom analysis</sup>
- ✿ Of those schools in Canada that report they use a PE specialist, a typical student receives PE from this specialist less than once a week in 6% of the schools, once or twice a week in 45% of schools, three to four times a week in 27% of schools, and every day in 22% of schools (2015 OPASS, CFLRI).<sup>Custom analysis</sup>
- ✿ The following proportion of schools/school boards/ministries in Canada report that they have fully or partially implemented policies related to physical activity (2015 OPASS, CFLRI).<sup>296</sup>
  - ✿ 77% provide age- and stage-appropriate developmental physical activity and sport programs.
  - ✿ 73% provide a range of physical activities for students.
  - ✿ 62% hire teachers with university qualifications to teach PE or activity.
  - ✿ 59% ensure ongoing funding for adequate equipment for student needs.
  - ✿ 28% ensure National Coaching Certification Program qualifications for coaches.
  - ✿ 25% provide opportunities for active transportation of students to/from school.
- ✿ Below are the proportion of schools/school boards in Canada that report having agreements with (2015 OPASS, CFLRI).<sup>298</sup>
  - ✿ Municipalities: 80% have agreements around the shared use of school or municipal facilities while 46% have agreements around shared programming and resources.
  - ✿ Sport organizations or physical activity clubs: 81% have agreements around the use of school facilities while 51% have agreements around shared programming and resources (e.g., instructors, officials, equipment).
- ✿ School administrators in Canada report that a number of amenities are available on-site at school including equipment for physical activity (97%), gymnasiums (94%), playing fields (88%), other green spaces or play areas (88%), paved areas used for active games (80%), outdoor basketball hoops (78%) and areas with playground equipment (71%) (2015 OPASS, CFLRI).<sup>299</sup>
- ✿ School administrators in Canada report that (2015 OPASS, CFLRI):
  - ✿ Their students have access to bicycle racks (80%) and change rooms (74%) during school hours.<sup>300</sup>
  - ✿ A number of facilities are available off-site near schools including other green spaces (89%), playing fields (84%), skating rinks (82%), areas with playground equipment (78%), baseball diamonds (75%) and walking/bicycling trails (74%).<sup>301</sup>
  - ✿ The indoor facilities (76%) and outdoor facilities (65%) for physical education and extracurricular physical activity programs located on school grounds meet the needs of students quite or very well.<sup>302</sup>
  - ✿ The indoor facilities (46%) and outdoor facilities (59%) for other types of physical activity and play located on school grounds meet the needs of students quite or very well.<sup>302</sup>



## Research Gaps

- More research is needed on the long-term impact of school-based interventions that focus on increasing walking (e.g., as a means of commuting to school) among students, particularly older students.<sup>303</sup>
- More research is needed on the development of effective school-based interventions for First Nations, Métis and Inuit children and youth.<sup>304</sup>
- Research is needed that explores the frequency and duration of outdoor time at childcare settings that maximize the physical activity of younger children and limits their sedentary time.<sup>305</sup>
- There is a need for novel ways to maximize/optimize the indoor spaces in childcare settings to help better support physical activity in young children.
- Capitalizing on natural experiments to examine the impact of school playground redesign on children's physical activity levels will offer direction for future school builds.
- Research examining the physical activity-related knowledge of childcare educators is important to ensure PE programming and playground affordances are supportive of adequate physical activity opportunities.

## Recommendations

- There is a need for PE specialists in elementary schools, and/or further training and professional development for generalist teachers who deliver PE to increase their knowledge and confidence to implement PE.
- Schools and communities should work together to make physical activity facilities available for use after school hours.
- It is important that schools incorporate at least 20 minutes of physical activity outside of PE class to support appropriate physical activity opportunities. This will also support improved learning among children and youth.
- Childcare centres should provide purposeful physical activity programming to complement the daily outdoor play sessions. Providing shorter, more frequent outdoor sessions may support improved physical activity.
- More physical activity opportunities can be provided in childcare and school settings by incorporating outdoor education into the curriculum.

## Literature Synthesis

As mentioned in previous Report Cards,<sup>71</sup> the sheer quantity of time students spend at school (approximately 6.5 hours per day, 180 days per year) makes schools and childcare settings ideal settings for physical activity promotion.<sup>303,306</sup> In addition to the well-established health benefits of physical activity (see *Why Is Physical Activity Important?* on page 6), increased physical activity at school may offer important academic-related benefits. A recent systematic review, for example, suggests that classroom-based physical activity may be associated with improvements in on-task classroom behaviour (e.g., concentration on teacher-assigned tasks) and academic achievement (e.g., performance on school-related tasks as evaluated by grades and standardized tests).<sup>307</sup>



## Barriers and Facilitators for School-Based Physical Activity Policy Implementation

Evidence for the effectiveness of school policies to improve lifestyle-related behaviours (e.g., physical activity) and reduce non-communicable disease risk factors (e.g., physical inactivity) is currently mixed, with some studies showing promising results while others do not.<sup>308</sup> Research is fairly consistent, however, that mandatory school physical activity policies are often not implemented fully, if at all,<sup>309</sup> which may be the main reason these policies are not more effective. A study of elementary schools in Ontario found that 10% of students in grades 5 to 8 reported receiving no PE in the previous week, with only 13% reporting at least four PE classes in the previous week.<sup>167</sup> A study of the implementation status of Ontario's DPA policy (which states that all elementary students must get at least 20 minutes of sustained MVPA on school days) found that 61% and 50% of elementary school administrators and classroom teachers, respectively, reported full implementation of the policy.<sup>310</sup> A number of factors were associated with full implementation at both the school and classroom levels including awareness of policy requirements, scheduling, monitoring, use of resources and supports, and the belief that the policy is both realistic and achievable.<sup>310</sup> This has been noted in other reviews of policy implementation, with time/scheduling and resource availability being common barriers.<sup>309,311</sup> A study in American elementary schools identified implementation climate (e.g., degree to which teachers think classroom physical activity is important and can improve student learning/behaviour, degree to which teachers support each other to implement classroom physical activity, administrator support of teachers, degree to which administrators make it difficult for teachers to provide classroom physical activity) as consistently linked with the implementation of a previously adopted classroom physical activity intervention, thus highlighting the potential importance of implementation strategies to address potential barriers among teachers and administrators.<sup>311</sup>

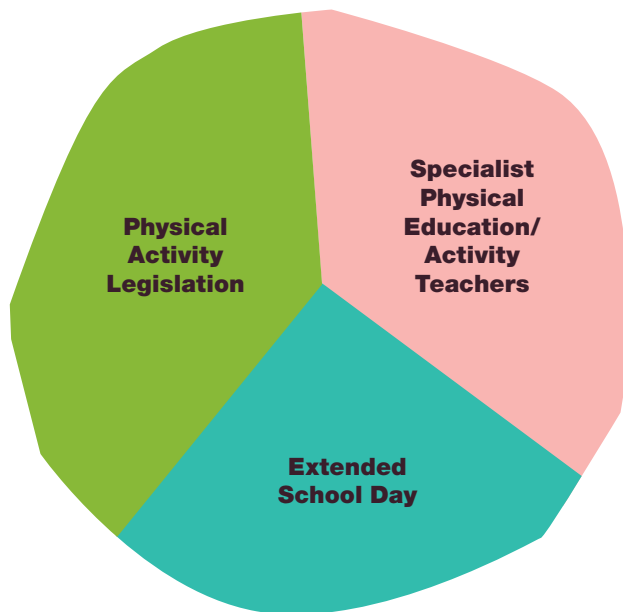
## School-Based Physical Activity Interventions

School-based interventions that focus on walking (e.g., active transportation to school) typically have a measure of success at increasing walking in younger students.<sup>303</sup> The impact is, however, generally short-term and small (e.g., four-minute increases in walking or running per day).<sup>303,306</sup> In some populations, school-based interventions are even less optimistic: a systematic review of interventions focusing on improvements in outcomes related to obesity (body mass index, body fat), physical activity and healthy eating among First Nations, Inuit and Métis youth in Canada found that these programs are generally not effective.<sup>304</sup>

Given these challenges with physical activity adoption and maintenance in the school setting, several researchers from Canada and the United States have proposed a three-part framework as a possible way forward for physical activity promotion efforts at school, particularly in younger students (Figure 15):<sup>306</sup>

- **Physical activity legislation:** evidence suggests that students in elementary schools with physical activity policies tend to be more active than their peers in school without these policies.
- **Extended school day:** since there are many demands on curriculum time, perhaps the school day needs to be extended by 30-60 minutes in order for physical activity legislation to be realistically implemented.
- **Training of teachers/recruitment of PE specialists:** evidence suggests that elementary schools often lack PE specialists. In addition, school teachers without training often lack confidence and the competencies necessary to teach PE effectively.

The authors of this framework suggest that all three components must be implemented in an integrated fashion; in isolation, these components are unlikely to be met with success. For example, the presence of physical activity legislation without adequate curriculum time or properly trained teachers is unlikely to be successful and may explain why current physical activity interventions seldom result in meaningful change.<sup>306</sup>



**Figure 15.** Proposed three-component framework for physical activity provision in North American elementary schools (source: adapted from Beauchamp et al, 2017<sup>306</sup>).

### Physical Activity in Differing Childcare Environments

As with the school setting, the childcare setting offers potential for physical activity promotion in the early years, which is an important avenue for increased efforts given that many young children spend substantial portions of their day in these venues.<sup>305</sup> Current evidence suggests that in centre-based childcare settings, children are more physically active outdoors (approximately 40% of the time) compared to indoors (approximately 20% of the time).<sup>305</sup> However, almost 60% of time spent outdoors is sedentary.<sup>305</sup> The first systematic review of research on physical activity levels among preschoolers in home-based childcare settings found that physical activity appears to be well below the recommended 180 minutes per day, but also varies substantially by study, therefore warranting further research.<sup>185</sup> When three different early learning environments were compared (centre-based childcare vs. home-based childcare vs. full-day kindergarten), children in full-day kindergarten accumulated more MVPA than children in the other two environments and also accumulated more daily physical activity at any intensity compared to those in a centre-based environment.<sup>312</sup>



### Ontario Revises DPA Policy

In October 2017 the Government of Ontario revised its policy on DPA, which requires all school boards to ensure that students in grades 1 to 8 – including students with special education needs – get at least 20 minutes of sustained MVPA each school day during instructional time.<sup>313</sup> According to the memorandum from the Deputy Minister of Education, “[t]he 2017 revised [Policy/Program Memorandum] provides flexibility by allowing these twenty minutes of physical activity to be divided into smaller time allocations throughout the instructional day (i.e. 5 and 10 minute blocks).”<sup>313</sup> For more details on the revision, please visit [www.edu.gov.on.ca/extra/eng/ppm/138.html](http://www.edu.gov.on.ca/extra/eng/ppm/138.html).

### Contributing Factors and Disparities

Data from the 2013-14 COMPASS study (University of Waterloo) of students in grades 9 to 12 in Alberta and Ontario revealed that large schools (> 1,000 students) had the most physical activity facilities on average, while medium-sized schools (501-1,000 students) had the most accessible facilities.<sup>314</sup> A study of elementary and secondary schools in Quebec found that elementary school size was positively associated with the number of indoor physical activity facilities available.<sup>315</sup> Low-income schools were less likely to have certain physical activity facilities (e.g., gymnasiums and bike racks in primary schools; soccer and multisport fields in secondary schools).<sup>315</sup> A study of elementary schools with grades 5 to 8 in Ontario found that the number of PE classes offered in the previous week, based on self-report, was higher in schools with two facilities that could be used for PE in addition to a gymnasium.<sup>167</sup>

# GRADE

# B+

## Community & Environment

**The benchmarks for this indicator relate to** community policy and programming, availability of infrastructure (e.g., parks and playgrounds), neighbourhood safety and the natural environment. This year's grade is a B+, which represents a slight decline from the A- assigned in 2016. New data showing that many municipalities in Canada have important infrastructure needs (e.g., maintenance, repair, improvements) prevent the indicator from being assigned a higher grade.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018
Community Policy & Programming Grade													
Grade	-/*	-/*	-/*	D/*	D/B+*	D/B+*	D/B+*	D/B+*	D/B+*	B			
Availability of Facilities, Programs, Parks & Playgrounds Grade													
	C	C	C**	B+	B	B	A-	A-	A-				
Neighbourhood Safety Grade										B+	B+	A-	B+
	—	B	—	—	B	B	B	B	B				
Natural Environment Grade													
	—	—	—	—	—	—	INC***	INC***	INC***				

- Benchmark
- Percentage of children or parents who perceive their community/municipality is doing a good job at promoting physical activity (e.g., variety, location, cost, quality).
  - Percentage of communities/municipalities that report they have policies promoting physical activity.
  - Percentage of communities/municipalities that report they have infrastructure (e.g., sidewalks, trails, paths, bike lanes) specifically geared toward promoting physical activity.
  - Percentage of children or parents who report having facilities, programs, parks and playgrounds available to them in their community.
  - Percentage of children or parents who report living in a safe neighbourhood where they can be physically active.
  - Percentage of children or parents who report having well-maintained facilities, parks and playgrounds in their community that are safe to use.

\*In the years prior to 2013, there were two separate indicators: Municipal Policies & Regulations and Community Programming. In 2013, these indicators were collapsed into a single indicator: Community Policy & Programming.

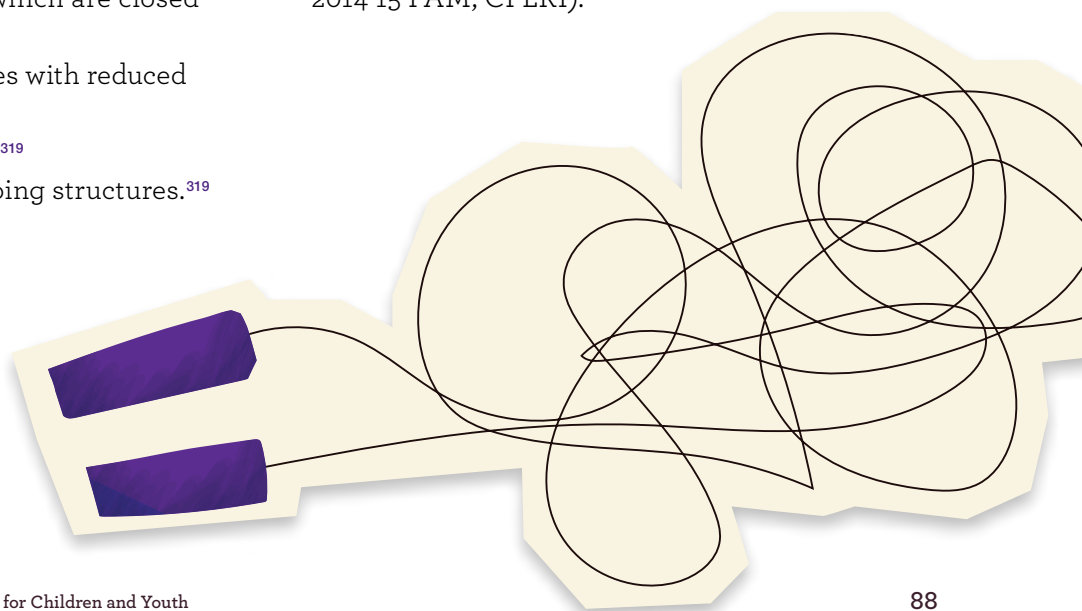
\*\* In 2005 and 2006, this indicator was called Proximity & Availability of Facilities, Programs, Parks & Playgrounds. The 2007 grade reflects both availability and usage. In all other years, availability was graded on its own.

\*\*\* This indicator has been in the Report Card since 2011 and was called Nature & the Outdoors until this year.

<b>Grading Scheme</b>	<b>A+ 94-100%</b>	<b>B+ 74-79%</b>	<b>C+ 54-59%</b>	<b>D+ 34-39%</b>
	<b>A 87-93%</b>	<b>B 67-73%</b>	<b>C 47-53%</b>	<b>D 27-33%</b>
	<b>A- 80-86%</b>	<b>B- 60-66%</b>	<b>C- 40-46%</b>	<b>D- 20-26%</b>
				<b>F 0-19%</b>

## Key Findings

- Among municipalities in Canada with at least 1,000 residents, as many as one third have policies that relate to physical activity (2015 Survey of Physical Activity Opportunities in Canadian Communities [SPA OCC], CFLRI):
  - Between one quarter and one third have a policy requiring safe pedestrian and bicycle routes when:
    - developing new areas in their community (38%)<sup>316</sup>
    - reconstructing roads in their community (34%)<sup>316</sup>
    - retrofitting existing communities (25%)<sup>316</sup>
  - 35% have formal strategies for physical activity and sport opportunities for residents in the community.<sup>317</sup>
  - 24% have a formal transportation master plan.<sup>318</sup>
  - 22% have a formal plan regarding active transportation.<sup>318</sup>
- Among municipalities in Canada with at least 1,000 residents, the majority report the presence of facilities that support community physical activity and sport (2015 SPA OCC, CFLRI):
  - 93% have parks and green spaces.<sup>319</sup>
  - 90% have baseball or softball diamonds.<sup>319</sup>
  - 88% have ice rinks.<sup>319</sup>
  - 84% have soccer or football fields.<sup>319</sup>
  - 82% have a walkable or pedestrian-friendly downtown core.<sup>320</sup>
  - 81% have community centres, halls or shared facilities.<sup>319</sup>
  - 79% have tennis or racquetball courts.<sup>319</sup>
  - 78% have multi-use trails, which are closed to vehicles.<sup>320</sup>
  - 75% have school safety zones with reduced speed limits.<sup>320</sup>
  - 73% have basketball courts.<sup>319</sup>
  - 73% have playing and climbing structures.<sup>319</sup>
  - 67% have arenas.<sup>319</sup>
  - 65% have gyms.<sup>319</sup>
- Among municipalities in Canada with at least 1,000 residents, approximately half report important infrastructure needs (2015 SPA OCC, CFLRI):
  - 59% report that improvements in the networking of trails, paths and sidewalks represent an important infrastructure need in the community.<sup>321</sup>
  - Close to half of administrators report that repair, maintenance and improvements to existing facilities are important, including:<sup>321</sup>
    - the repair of outdoor sport and recreational facilities (46%)
    - improved linkages of bicycle pathways and lanes with roadways (46%)
    - repair of indoor sport and recreational facilities (43%)
    - maintenance of walking, bicycling and multi-purpose trails (43%)
    - maintenance of playgrounds and green spaces (42%)
- Among municipalities in Canada with at least 1,000 residents, 65% of municipal administrators report that more walking, bicycling or multi-purpose trails are the most pressing infrastructure need for increasing physical activity. Other pressing needs within many communities include more indoor sport and recreation facilities (54%), more outdoor sport and recreation facilities (49%) and more playgrounds and green spaces (30%) (2015 SPA OCC, CFLRI).<sup>321</sup>
- Less than 20% of parents report that crime, traffic or poorly maintained sidewalks are an issue in their neighbourhood (based on a subsample of the 2014-15 PAM, CFLRI).





- Among municipalities in Canada with at least 1,000 residents, 26% strongly agree that low levels of lighting on sidewalks and streets discourages walking or bicycling at night.<sup>321</sup>
- Among municipalities in Canada with at least 1,000 residents, 14% strongly agree that the amount of crime on streets discourages walking or bicycling.<sup>321</sup>
- The homicide rate in Canada in 2016 for all ages (1.68 per 100,000) is essentially unchanged from 2015 (1.70 per 100,000) (2015-16 Uniform Crime Reporting Survey [UCRS], Statistics Canada).<sup>322</sup>
- Although police-reported violent crime has declined overall, sexual violations against children increased by 30% in 2016 (14.66 per 100,000 in 2015 vs. 19.06 per 100,000 in 2016), with luring a child via a computer being the second largest group of violations (21% or 1,295 incidents) (2015-16 UCRS, Statistics Canada).<sup>322,323</sup>
  - The rate of luring a child via a computer in 2016 (3.57 per 100,000) is 19% higher than in 2015 (3.00 per 100,000) (2015-16 UCRS, Statistics Canada).<sup>322</sup>
  - **Note:** “It is...important to note that, for the violations included in ‘sexual violations against children’, differences in police-reported statistics between geographic areas or across time may be influenced by levels of reporting to police, as well as by single incidents that include several victims. In addition, certain police services dedicate special units to investigate these types of crime, which can also impact differences by geographic areas or changes over time. Similar to sexual assaults in general, the number of sexual violations against children is also expected to be an underestimate due to compounding factors that are likely to impact reporting, such as reliance on an adult to bring the incident to the attention of police. In addition, sexual offences against children can be delayed in coming to the attention of the police and those reported may have occurred in previous years.”<sup>323</sup>
- The child abduction rate (by non-parents/non-guardians) in Canada in 2016 for children and youth under 14 years of age (0.32 per 100,000) is 14% lower than in 2015 (0.37 per 100,000) (2015-16 UCRS, Statistics Canada).<sup>322</sup>

## Research Gaps

- Health economic analyses and policy evaluations that incorporate case studies and natural experiments are needed in order to translate research on the built environment into the development of effective policy and planning initiatives that promote healthy active living.<sup>324,325</sup>
- There is a need for research on how to integrate physical activity into official community plans.
- An update should be conducted on the existence of municipal policies or bylaws that restrict physical activity or outdoor play of children and youth.
- More data are needed on availability of physical activity facilities and programming in rural and remote communities.

## Recommendations

- Communities should dedicate part of their capital plan to recreation facility revitalization.
- Create and promote the development of natural playgrounds to supplement or replace traditional playgrounds in order to help engage children in outdoor play and enhance their connection with nature. Natural playgrounds are areas where children can play with natural elements such as sand, water, wood and living plants.
- Ensure that children and youth with disabilities are always included and integrated into community programs by providing appropriate training to recreation leaders.



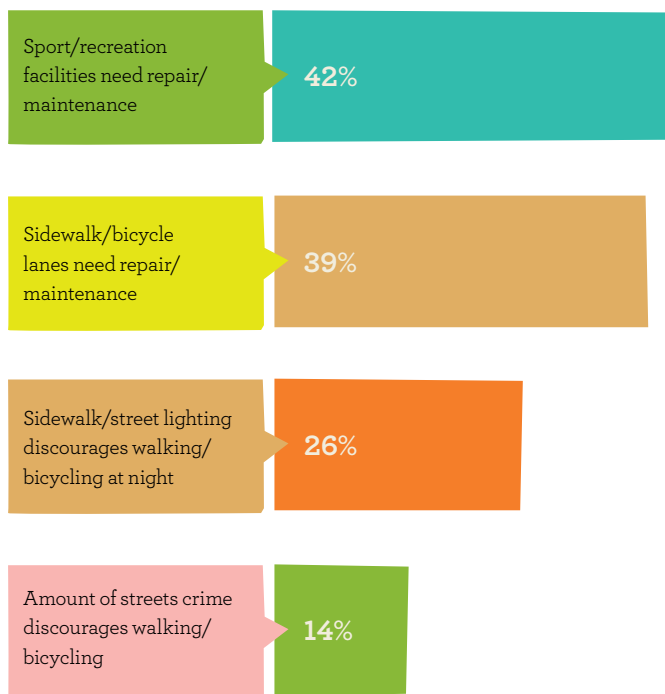
## Literature Synthesis

With many elements of the community and environment (e.g., sport and recreation clubs, aquatic venues, park space, separation of cycle paths and multi-use path space) being positively associated with physical activity in children and youth,<sup>326,327,328,329</sup> this setting – as with other settings that are highlighted in the Report Card such as the home and schools – represents promise for physical activity promotion efforts. Though it is possible that increases in physical activity in one setting (e.g., neighbourhood) could lead to compensation whereby physical activity decreases in another setting (e.g., school), there is evidence suggesting that this is not necessarily the case<sup>330</sup> and, therefore, children and youth should be encouraged to be physically active across multiple settings, contexts and locations. Of the few studies available using both accelerometers and GPS to understand physical activity patterns across locations, results suggest that parks/green spaces are among the most common destinations for active transportation,<sup>107</sup> while streets and recreational facilities are among the top locations where children get the largest portions of their daily MVPA.<sup>331</sup>

### Perceived Infrastructure Barriers to Physical Activity

New data from CFLRI's municipal survey reveal many physical activity infrastructure barriers and needs, centring around repair, maintenance and improvement of existing structures and facilities (Figure 16).<sup>321</sup> Indeed, results from the Canadian Infrastructure Report Card reveal that only 54% of sport and recreation facilities in Canada have a good or very good physical condition rating.<sup>332</sup> At current reinvestment levels, the physical condition of these facilities is anticipated to decline over time.<sup>332</sup>

There are also additional infrastructure needs. For example, in communities of at least 1,000 residents, 65% of municipal administrators report that more walking, bicycling or multi-purpose trails are the most pressing infrastructure need for increasing physical activity.<sup>321</sup> Other pressing needs within many communities include more indoor sport and recreation facilities (54%), more outdoor sport and recreation facilities (49%) and more playgrounds and green spaces (30%).<sup>321</sup>



**Figure 16.** Proportion of municipalities in Canada strongly agreeing with perceived infrastructure barriers (source: 2015 SPAOCC, CFLRI<sup>321</sup>).

### Neighbourhood Safety

It is generally believed that parents will often limit the independent mobility of their children (i.e., freedom to move around the neighbourhood without adult supervision<sup>333</sup>), particularly when they perceive the neighbourhood they live in to be unsafe (e.g., traffic safety, pedestrian safety, crime, stranger danger).<sup>334</sup> Studies have shown that children are more likely to engage in independent mobility and active transportation to/from school when their parents think the neighbourhood is safe and/or have little fear of neighbourhood crime.<sup>142,333</sup> Evidence suggests that parental safety concerns are also related to youth physical activity in the neighbourhood.<sup>335</sup> Similar to what is seen in children and youth, parental safety concerns are one of the main barriers restricting physical activity in preschool children as well.<sup>288,336</sup>

A study of 8- to 10-year-olds at risk for obesity in Quebec examined both parent and child perceptions of neighbourhood safety.<sup>334</sup> Results revealed that when parent and child safety perceptions were considered together, parental perceptions of safety were more strongly related to the child's screen time, while the child's perceptions of safety were more strongly related to their physical activity.<sup>334</sup> Thus, physical activity promotion efforts may need to target perceptions of neighbourhood safety in both parents and children.<sup>334</sup>

### Barriers to Spending Time Outdoors

In a 2017 Nature Valley survey, Canadians (500 adults, and 200 children and youth) shared their perspectives on spending time in the outdoors.<sup>337</sup> Over half of respondents (55%) believed nature is relaxing, 46% claimed it clears their mind, 32% of parents were aware of the cardiovascular benefits for their kids and 26% believed it encourages independence.<sup>337</sup> Despite these benefits, several reasons prevented them from prioritizing time outdoors, including societal pressures (e.g., pressure to enrol kids in organized, structured activities instead of letting them play freely in nature), not having enough time, being too tired, inclement weather and technology/screens (e.g., preference among children and youth for spending time on social media and gaming).<sup>337</sup>

## Contributing Factors and Disparities

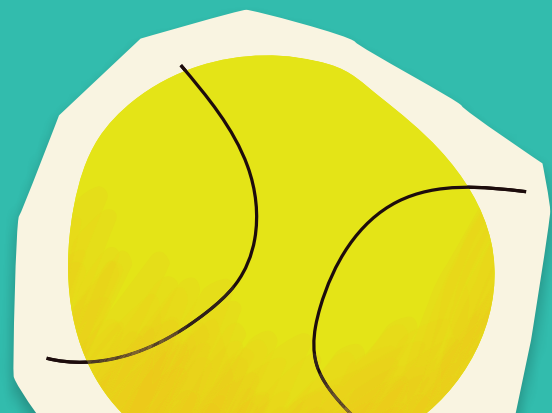
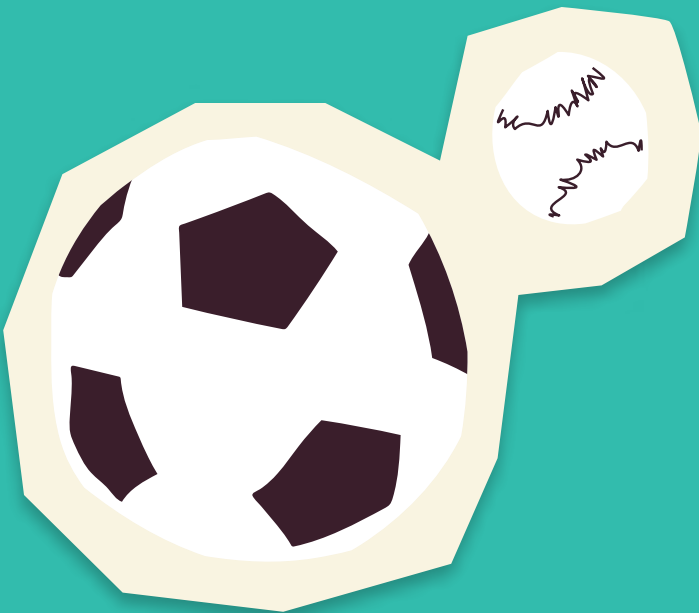
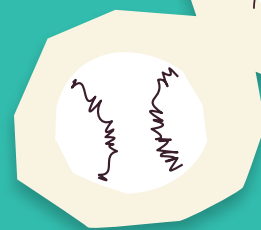
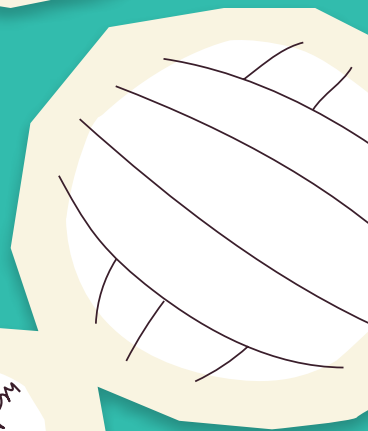
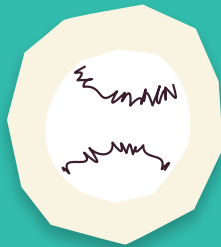
Data on 12- to 17-year-olds from multiple cycles of the Canadian Community Health Survey (2003, 2005, 2007, 2009, 2011) reveal several sex-, geographic- and provincial/territorial-related disparities.<sup>338</sup> While statistically controlling for age, ethnic origin, household education and body mass index:<sup>338</sup>

- Among girls, those living in urban outskirts or rural areas were more likely to meet the physical activity recommendation within the Canadian 24-Hour Movement Behaviour Guidelines for Children and Youth.<sup>52</sup>
- Girls living in Quebec were less likely to meet the physical activity recommendation compared to the national average, while girls in Ontario and British Columbia were more likely to meet the recommendation.
- Boys were not more or less likely to meet the physical activity recommendation based on where they lived (e.g., urban, urban outskirts, rural area), which may suggest that urban facilities are better suited to boys.
- Boys living in Ontario were more likely to meet the physical activity recommendation compared to the national average.



REPORT CARD INDICATORS:

# Strategies & Investments



# GRADE

# C+

## Government

**This year's grade is a C+** and

represents a slight decline from the B- assigned in 2016.

Although there are observable efforts to increase physical activity support, there is little evidence that this support will impact child and youth physical activity directly.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2018
Federal Government Strategies & Investments Grade													
Grade	C-	—	C	C+	C	C+/F*	C/F*	D/F*	C-	C	B-	B-	C+
Provincial/Territorial Government Strategies & Investments Grade													
	INC	—	C	C+	C+	B+/C.**	B+/C.**	B+/C.**	C				

- Benchmark
- Evidence of leadership and commitment in providing physical activity opportunities for all children and youth.
  - Allocated funds and resources for the implementation of physical activity promotion strategies and initiatives for all children and youth.
  - Demonstrated progress through the key stages of public policy making (i.e., policy agenda, policy formation, policy implementation, policy evaluation and decisions about the future).

\* In years prior to 2010, there was one indicator: Federal Government Strategies & Investments. From 2010 to 2012, there were two separate indicators: Strategies and Investments. In 2013, these indicators were again collapsed into a single indicator.

\*\* In years prior to 2010, there was one indicator: Provincial/Territorial Government Strategies & Investments. From 2010 to 2012, there were two separate indicators: Strategies and Investments. In 2013, these indicators were again collapsed into a single indicator.

Grading Scheme	A+ 94-100%	B+ 74-79%	C+ 54-59%	D+ 34-39%	
	A 87-93%	B 67-73%	C 47-53%	D 27-33%	F 0-19%
	A- 80-86%	B- 60-66%	C- 40-46%	D- 20-26%	

## Key Findings

- The 2018 federal budget highlighted the government's commitment to improving the country's physical activity levels by pledging to invest \$5 million per year for five consecutive years (totaling \$25 million) to ParticipACTION.<sup>339</sup>
- Approximately \$2 million dollars has also been committed by Sport Canada annually for the next two years to support ParticipACTION's efforts to increase sport participation.<sup>339</sup>
- The federal budget also announced \$30 million over three years to support data and research and innovative practices to promote women's and girls' participation in sport, and \$47.5 million over five years as well as \$9.5 million per year ongoing to expand the use of sport for social development in more than 300 Indigenous communities.<sup>339</sup>



- The federal government invested \$300 million in the Canada 150 Community Infrastructure Program (CIP 150), which was delivered by regional development agencies across the country to celebrate Canada's 150th anniversary of Confederation in 2017. The national program supported the renovation, expansion and improvement of existing community and cultural infrastructure, which included parks, recreational trails such as fitness trails, arenas, pools, fields and recreation centres. For more information, visit [www.feddevontario.gc.ca/eic/site/723.nsf/eng/h\\_02195.html](http://www.feddevontario.gc.ca/eic/site/723.nsf/eng/h_02195.html).
- The federal government created the Canada 150 Fund, a funding initiative with the aim of promoting Canadian values, culture and history, generating national pride and bringing people together to celebrate Canada 150.
  - One initiative that was funded was the ParticipACTION 150 Play List, which encouraged Canadians to try as many activities as possible and find the ones they love.
- The 2017 federal budget announced federal investment of \$1.3 billion to be invested in community, cultural and recreational infrastructure, which includes sport. These funds will be delivered by Infrastructure Canada through integrated bilateral agreements.
  - This budget proposed to invest \$18.9 million over five years – and ongoing funding of \$5.5 million on a four-year cycle thereafter – to support Indigenous Youth and Sport initiatives.
- Since 2013, the Public Health Agency of Canada has invested over \$73 million and leveraged an additional \$57 million from non-taxpayer funding sources to increase the impact of federal programs aimed at increasing physical activity and other related health behaviours.
- Federal, provincial and territorial ministers responsible for sport, physical activity and recreation are working to develop a pan-Canadian physical activity policy framework to guide and stimulate coordinated and collaborative policies and actions to increase physical activity and reduce sedentary behaviour among all Canadians across the life course.

- ✿ In September 2017, the Ontario Minister of Education announced new and expanded funding with the intent of boosting the cognitive, physical, social and emotional well-being of Ontario students.<sup>340</sup> More than \$3 million of this funding is earmarked for active transportation, including walking school buses and biking-to-school programs that create more physical activity opportunities for students.<sup>340,341</sup>
- ✿ On October 20, 2017, the federal, provincial and territorial (FPT) Ministers of Health and Healthy Living endorsed and released the 2017 e-Report on Healthy Weights ([www.towardsahealthiercanada.ca](http://www.towardsahealthiercanada.ca)). The joint Ministerial Message with the FPT Ministers responsible for sport, physical activity and recreation continues to demonstrate shared leadership on promoting healthier living.
  - ✿ This third e-Report provides an update of the most recently available data on indicators of healthy weights. A health inequalities lens was also added to the 2017 e-Report. Unfortunately, little has changed over the past three iterations of this report.
- ✿ HALO, the University of Alberta, the Canadian Society for Exercise Physiology and ParticipACTION, with support from the Public Health Agency of Canada, led the development of the Canadian 24-Hour Movement Guidelines for the Early Years (0-4 years).
- ✿ According to representatives from two provincial governments (British Columbia, Newfoundland and Labrador), the level of financial investment in 2017 within their respective provinces related to increasing children and youth participation in sport and physical activity has remained the same when compared to previous years.

## Research Gaps

- ✿ Research is needed to gain a better understanding of what is required in financial, human and program resources to reverse trends in physical activity and sedentary behaviour in Canadian children and youth.
- ✿ There is an ongoing need to implement common tools and metrics for measuring all movement behaviours (physical activity, sedentary behaviour and sleep) at the national level, and across each province and territory.
- ✿ Natural experiments such as the introduction of new physical activity, sport, or recreation policies and programs should be evaluated when possible.
- ✿ More insight is required on the extent to which governments are subsidizing the cost of children and youth participation in organized sport and recreation programs.

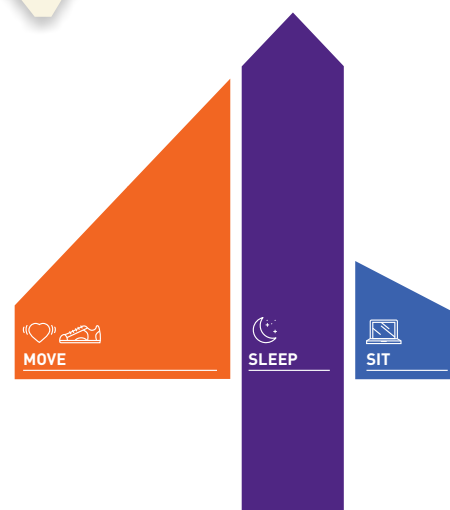
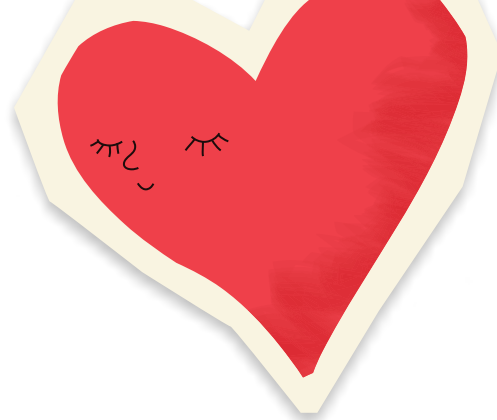
## Recommendations

- ✿ Enhance collaborations and alignment across the federal and provincial/territorial governments to develop, support and sustain physical activity research efforts, including program implementation and evaluation.
- ✿ Provide leadership development, training and community capacity building for those living in rural or remote communities, for new Canadians and marginalized populations.
- ✿ Work with other organizations, such as the Conference Board of Canada, to understand the investment required to increase physical activity in Canada.
- ✿ Enhance capacity and consistency in childcare settings and schools to provide opportunities to develop physical literacy, and to increase physical activity and decrease sedentary time.
- ✿ Invest in training around understanding the importance of the natural and outdoor environment when it comes to play education.
- ✿ Governments at all levels should intentionally address people with the greatest need and access issues by targeting policies to eliminate disparities in participation levels.

# Spotlights

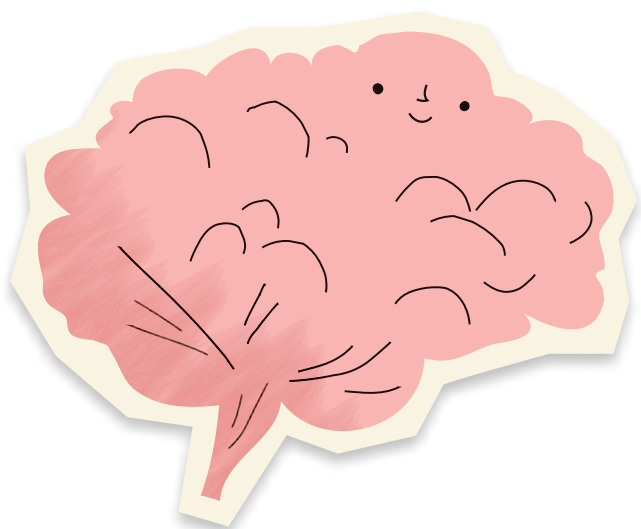
## A Common Vision for Increasing Physical Activity and Reducing Sedentary Living in Canada

In July 2017, FPT Ministers responsible for sport, physical activity and recreation gathered in Winnipeg for a two-day conference to discuss the advancement of sport, physical activity and recreation in Canada.<sup>342</sup> During these discussions, FPT Ministers acknowledged the importance of a common physical activity vision for all governments and stakeholders involved in the promotion of physical activity for all Canadians.<sup>342</sup> They also recognized the accomplishments of the pan-Canadian physical activity framework and asked that work continue with a view to enhance the framework to further reflect Indigenous perspectives.<sup>342</sup> For more information, visit [www.scics.ca/en/product-produit/news-release-sport-physical-activity-and-recreation-ministers-receive-progress-report-on-physical-activity-and-collaborate-on-concussions-in-sport](http://www.scics.ca/en/product-produit/news-release-sport-physical-activity-and-recreation-ministers-receive-progress-report-on-physical-activity-and-collaborate-on-concussions-in-sport).



## Canadian 24-Hour Movement Guidelines for the Early Years (0-4 Years): An Integration of Physical Activity, Sedentary Behaviour, and Sleep

HALO-CHEO, the Canadian Society for Exercise Physiology, ParticipACTION and the University of Alberta, with support from the Public Health Agency of Canada, led the development of the Canadian 24-Hour Movement Guidelines for the Early Years (0-4 Years): An Integration of Physical Activity, Sedentary Behaviour, and Sleep. These integrated guidelines harmonize recommendations for physical activity, sedentary behaviour and sleep, and represent the first time these behaviours have been integrated as a single recommendation. The initiative included updating existing and performing new systematic reviews in young children (0-4 years) to examine the relationship between different intensities (light, moderate, vigorous) of objectively measured physical activity and important health indicators; developing the guidelines by following established protocols for clinical practice guideline development; using the evidence from systematic reviews, findings from national health survey analyses and input from the co-applicants including knowledge users and international collaborators; and disseminating the guidelines and planning their evaluation.





### **The ParticipACTION 150 Play List**

The ParticipACTION 150 Play List, which was created by more than 465,000 votes from people across Canada, included 150 physical activities representing Canada and its uniqueness. The Play List challenged Canadians in communities, schools, workplaces and abroad to see how many different activities they could complete in 2017.<sup>343</sup> Canadians checked off more than two million physical activities throughout 2017.<sup>343</sup> 62% of Play List participants participated in the program to celebrate Canada's 150th birthday, 58% reported that it helped get them off the couch more and 50% reported that they were more physically active because of it.<sup>343</sup> To learn more about the ParticipACTION 150 Play List, visit: [www.participaction.com/en-ca/programs/participaction-150-play-list](http://www.participaction.com/en-ca/programs/participaction-150-play-list).

### **WHO Global Action Plan on Physical Activity 2018-2030**

In 2013, the World Health Assembly endorsed a Global Action Plan on the Prevention and Control of Non-Communicable Disease and agreed on a set of nine global voluntary targets, which include a 25% reduction of premature mortality from non-communicable diseases and a 10% relative reduction in the prevalence of insufficient physical activity by 2025. Within this plan is a focus on children and youth, whereby safe environments and reduction of sedentary behaviours and opportunities are key points. As part of the global review process of this plan, ParticipACTION and HALO-CHEO contributed feedback to initial drafts of this document, thus demonstrating Canada's role in promoting physical activity and sedentary behaviours for children and youth everywhere.



# ABBREVIATIONS

Term	Definition / Description
<b>CANPLAY</b>	Canada's Physical Activity Levels Among Youth study
<b>CAPL</b>	Canadian Assessment of Physical Literacy
<b>CAPL-1</b>	Canadian Assessment of Physical Literacy, 1st edition
<b>CAPL-2</b>	Canadian Assessment of Physical Literacy, 2nd edition
<b>CFLRI</b>	Canadian Fitness and Lifestyle Research Institute
<b>CHEO</b>	Children's Hospital of Eastern Ontario
<b>CHMS</b>	Canadian Health Measures Survey
<b>CHSCY</b>	Canadian Health Survey on Children and Youth
<b>COMPASS</b>	Cohort Study for Obesity, Marijuana Use, Physical Activity, Alcohol Use, Smoking and Sedentary Behaviour
<b>CS4L</b>	Canadian Sport 4 Life
<b>DPA</b>	Daily Physical Activity
<b>FPT</b>	Federal, provincial and territorial
<b>GIS</b>	Geographic information system
<b>GPS</b>	Global Positioning System
<b>HALO</b>	Healthy Active Living and Obesity Research Group
<b>HBSC</b>	Health Behaviour in School-Aged Children survey
<b>IPA</b>	International Play Association
<b>ISRC</b>	Interprovincial Sport and Recreation Council
<b>METS</b>	Metabolic equivalents
<b>MVPA</b>	Moderate- to vigorous-intensity physical activity
<b>OPASS</b>	Opportunities for Physical Activity at School Study
<b>PAM</b>	Physical Activity Monitor
<b>PE</b>	Physical Education
<b>PHAC</b>	Public Health Agency of Canada
<b>PHE</b>	Physical and Health Education Canada
<b>PLAY</b>	Physical Literacy Assessment for Youth
<b>PREPS</b>	Parents' Role in Establishing Healthy Physical Activity and Sedentary Behaviour Habits
<b>RBC</b>	Royal Bank of Canada
<b>RCRC</b>	Report Card Research Committee
<b>SBRN</b>	Sedentary Behaviour Research Network
<b>SHAPES-PEI</b>	School Health Action Planning and Evaluation System – Prince Edward Island
<b>SPA OCC</b>	Survey of Physical Activity Opportunities in Canadian Communities
<b>UCRS</b>	Uniform Crime Reporting Survey
<b>WHO</b>	World Health Organization

# SUMMARY OF INDICATORS

					2018 Report Card Grades				
					0-19%	20-39%	40-59%	60-79%	80-100%
Category	#	Indicator Name	Benchmark(s)		F	D	C	B	A
Daily Behaviours	1	<b>Overall Physical Activity</b>	% of children and youth who meet the physical activity recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth (at least 60 minutes of daily MVPA). % of preschoolers who meet the physical activity recommendation within the Canadian 24-Hour Movement Guidelines for the Early Years (at least 180 minutes of daily physical activity, of which at least 60 minutes is energetic play).						
	2	<b>Active Play &amp; Leisure Activities</b>	% of children and youth who engage in active play and non-organized/unstructured leisure activities for several hours a day.						
	3	<b>Active Transportation</b>	% of children and youth who typically use active transportation to get to and from places (e.g., school, park, mall, friend's house).						
	4	<b>Organized Sport Participation</b>	% of children and youth who participate in organized sport programs.						
	5	<b>Physical Education</b>	% of K-8 students receiving at least 150 minutes of physical education per week. % of high school students taking physical education. % of students receiving Daily Physical Activity (DPA), in provinces that have DPA policies.						
	6	<b>Sedentary Behaviours</b>	% of children and youth who meet the screen time recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth (no more than 2 hours of recreational screen time per day). % of preschoolers who meet the screen time recommendation within the Canadian 24-Hour Movement Guidelines for the Early Years (no more than 1 hour of sedentary screen time per day).						
	7	<b>Sleep</b>	% of children and youth who meet the sleep recommendation within the Canadian 24-Hour Movement Guidelines for Children and Youth (5- to 13-year-olds: 9-11 hours per night; 14- to 17-year-olds: 8-10 hours per night). % of preschoolers who meet the sleep recommendation within the Canadian 24-Hour Movement Guidelines for the Early Years (3- to 4-year-olds: 10-13 hours per night).						
	8	<b>24-Hour Movement Behaviours</b>	% of children and youth who meet the MVPA, screen time and sleep recommendations within the Canadian 24-Hour Movement Behaviour Guidelines for Children and Youth. % of preschoolers who meet the physical activity, screen time and sleep recommendations within the Canadian 24-Hour Movement Behaviour Guidelines for the Early Years.						
Individual Characteristics	9	<b>Physical Literacy</b>	% of children and youth who meet the recommended levels of physical competence, knowledge, motivation and daily behaviours needed for a physically active lifestyle.						
	10	<b>Physical Fitness</b>	Average percentile of cardiorespiratory fitness achieved based on age- and sex-specific international normative data. % of children and youth who meet criterion-referenced standards for muscular strength. % of children and youth who meet criterion-referenced standards for muscular endurance. % of children and youth who meet criterion-referenced standards for flexibility.						
	11	<b>Family &amp; Peers</b>	% of parents who facilitate physical activity and sport opportunities for their children (e.g., volunteering, coaching, driving, paying for membership fees and equipment). % of parents who meet the Canadian Physical Activity Guidelines for Adults. % of parents who are physically active with their kids. % of children and youth with friends and peers who encourage and support them to be physically active. % of children and youth who encourage and support their friends to be physically active.						
	12	<b>School</b>	% of schools with active school policies (e.g., daily physical education [PE], daily physical activity, recess, "everyone plays" approach, bike racks at school, traffic calming on school property, outdoor time). % of schools where the majority (≥ 80%) of students are taught by a PE specialist. % of schools where the majority (≥ 80%) of students are offered at least 150 minutes of PE per week. % of schools that offer physical activity opportunities (excluding PE) to the majority (≥ 80%) of their students. % of parents who report their children and youth have access to physical activity opportunities at school in addition to PE classes. % of schools with students who have regular access to facilities and equipment that support physical activity (e.g., gymnasium, outdoor playgrounds, sporting fields, multipurpose space for physical activity, equipment in good condition).						
Settings & Sources of Influence	13	<b>Community &amp; Environment</b>	% of children or parents who perceive their community/municipality is doing a good job at promoting physical activity (e.g., variety, location, cost, quality). % of communities/municipalities that report they have policies promoting physical activity. % of communities/municipalities that report they have infrastructure (e.g., sidewalks, trails, paths, bike lanes) specifically geared toward promoting physical activity. % of children or parents who report having facilities, programs, parks and playgrounds available to them in their community. % of children or parents who report living in a safe neighbourhood where they can be physically active. % of children or parents who report having well-maintained facilities, parks and playgrounds in their community that are safe to use.						
	14	<b>Government</b>	Evidence of leadership and commitment in providing physical activity opportunities for all children and youth. Allocated funds and resources for the implementation of physical activity promotion strategies and initiatives for all children and youth. Demonstrated progress through the key stages of public policy making (i.e., policy agenda, policy formation, policy implementation, policy evaluation and decisions about the future).						
Strategies & Investments									

# Methodology & Data Sources

Unlike other report card publications, which often rely on a single data source, the ParticipACTION Report Card synthesizes data from multiple data sources and the research literature. The development of indicators and the assignment of grades involve an interdisciplinary Report Card Research Committee, including researchers from across Canada. A biennial summary of research data and literature is prepared by staff within HALO-CHEO ([www.haloresearch.ca](http://www.haloresearch.ca)) to facilitate the review of the information. Grade assignments are determined based on examination of the current data and literature for each indicator against a benchmark or optimal scenario, assessing the indicator to be poor, adequate, good or excellent:

- A** = We are succeeding with a large majority of children and youth.
- B** = We are succeeding with well over half of children and youth.
- C** = We are succeeding with about half of children and youth.
- D** = We are succeeding with less than half, but some, children and youth.
- F** = We are succeeding with very few children and youth.

National data take precedence over sub-national and regional data, and objectively measured data take precedence over subjectively measured data. Although no longer factoring into grade assignments, trends over time and the presence of disparities are highlighted where applicable. Disparities are primarily based on disabilities, race/ethnicity, immigration status, geography (provincial/territorial comparisons), socio-economic status, urban/rural setting, gender and age (e.g., adolescence).

A given indicator grade is assigned after applying weightings to the key findings in order to provide a more fair and valid representation of the overall proportion of children and youth meeting a given benchmark. This is important because how the key findings are weighted can have considerable impact on the eventual letter grade for an indicator.

Some indicators are stand-alone, while others are comprised of several components. During the grade assignment meeting, each component of an indicator is assessed. Over the evolution of the Report Card, there has been an attempt to move toward indicators that are broad enough to contain various components in their assessment so that indicators can become more consistent from year to year.

## The Following are Major Data Sources Used in the 2018 Report Card:

**Canadian Health Measures Survey (CHMS; [goo.gl/dnZ41C](http://goo.gl/dnZ41C)):** The Canadian Health Measures Survey, launched in 2007, is collecting key information relevant to the health of Canadians by means of direct physical measurements such as blood pressure, height, weight and physical fitness. In addition, the survey is collecting blood and urine samples to test for chronic and infectious diseases, as well as nutrition and environment markers. Through household interviews, the CHMS is gathering information related to nutrition, smoking habits, alcohol use, medical history, current health status, sexual behaviour, lifestyle and physical activity, the environment and housing characteristics, as well as demographic and socio-economic variables.

**Canadian Physical Activity Levels Among Youth study (CANPLAY; [www.cfri.ca](http://www.cfri.ca)):** The Canadian Fitness and Lifestyle Research Institute conducted a

major national survey annually to examine physical activity levels of children and youth. CANPLAY studied the current fitness and physical activity patterns of young people in Canada. Approximately 10,000 children and youth (approximately 6,000 families) were randomly selected across Canada. The study was conducted from 2005 to 2016. Pedometers were used to measure the number of steps taken daily by each participant. CANPLAY was a joint venture of the Canadian Fitness and Lifestyle Research Institute and the Interprovincial Sport and Recreation Council.

**Cohort Study for Obesity, Marijuana Use, Physical Activity, Alcohol Use, Smoking and Sedentary Behaviour (COMPASS; [www.uwaterloo.ca/compass-system](http://www.uwaterloo.ca/compass-system)):** The COMPASS study is a nine-year study (started in 2012-13) about youth health behaviours funded by the Canadian Institutes of Health Research and Health Canada. It is being conducted and led by researchers at the University of Waterloo in collaboration with researchers at the University of Alberta, the University of British Columbia, and the University of Toronto:

- Participating students in grades 9 to 12 are surveyed once annually.
- COMPASS tracks any changes made to the school's health policies and programs over time.
- Each year, participating schools receive a detailed feedback report, which will include evidence-based recommendations for health policy and program improvement.
- COMPASS has support staff and resources available to schools to help them translate these recommendations into action.

This is the first time in Canada and the world that a survey will allow us to see changes in youth health behaviours over time; determine whether changes

to school health policies and programs are effective; and work directly with schools to implement change.

**Opportunities for Physical Activity at School Study (OPASS; [www.cflri.ca](http://www.cflri.ca)):** The content of the 2015 OPASS is designed to explore the availability and composition of physical education programming at school, determine the availability and adequacy of facilities and opportunities for physical activity, explore the provision of extracurricular physical activities, examine policies related to physical activity at school, and describe the broader physical and social environments at school. The survey consists of a self-completed questionnaire that was mailed to a total of 8,000 Canadian schools. The survey was conducted by the CFLRI with funding support from the Interprovincial Sport and Recreation Council, and in partnership with PHE Canada.



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