Implementation Guide for a Flexible Environment

PRIMARY AND SECONDARY SCHOOLS

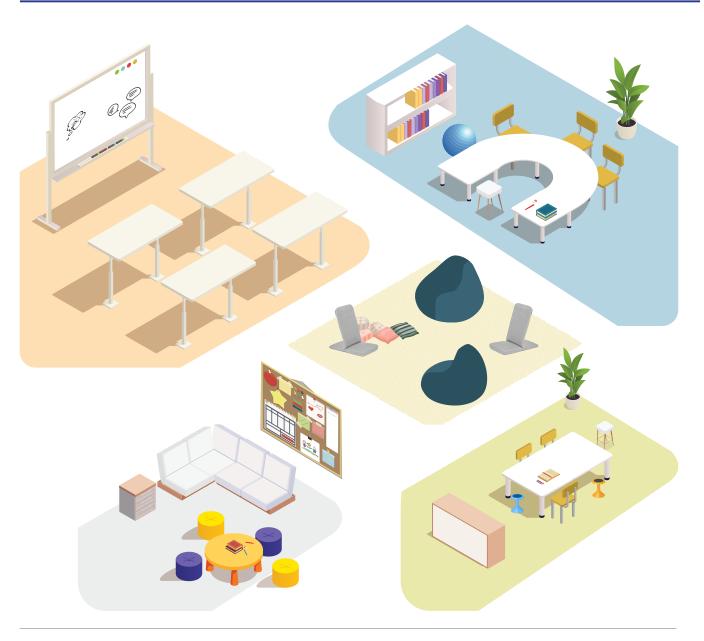












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Contributions and acknowledgments

This guide is the end result of the review of the regional pilot project of the *MA classe flexible* (My flexible classroom) Program and would not have been possible without the collaboration and commitment of several key players.

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PILOT PROJECT REVIEW TEAM

Project manager:

Mariane Julien, B. Sc., Kinesiologist **Review Plan Manager:** Alix St-Aubin, B. Sc., kinesiologist

Carole-Lynn Massie, B. Sc, kinesiologist and Valérie Boulay-Pelletier B. Ed.

Reviewers primary and secondary levels:

Alix St-Aubin, Carole-Lynn Massie, Lisa Fournier, B.Sc., kinesiologist and Valérie Boulay-Pelletier

GUIDE EDITORIAL TEAM

Research and writing:

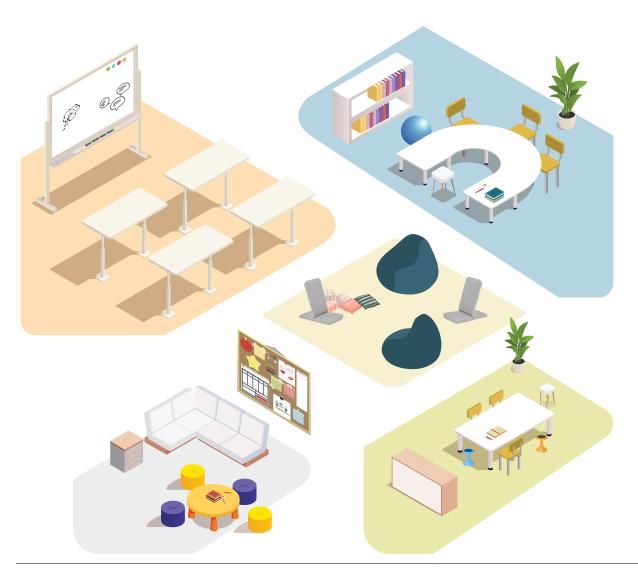
Alix St-Aubin, Carole-Lynn Massie and Valérie Boulay-Pelletier **Linguistic revision and translation:** Maude B. Pelletier

Who should read this guide

The Implementation Guide for a Flexible Environment is intended as a reference for all teachers, stakeholders and school leaders at the primary and secondary school levels, who wish to contribute to the health and well-being of students, through the adoption of a flexible learning environment.

This guide contains theoretical elements from a summary of recent scientific literature on interventions (flexible layout and active breaks) aimed at reducing sedentary behaviour in the classroom in elementary and secondary school. Government publications and other credible sources were also used as references to build the argument.

The practical elements, for their part, are based on a summary of the inventory of interventions demonstrated to be effective (literature review), as well as the results observed and measured objectively within the framework of the review of the regional pilot project of the *MA classe flexible* Program (detailed in the following pages).



Introduction

The beneficial effects of physical activity and the risks associated with physical inactivity have been recognized for several years. Recent knowledge now allows us to distinguish between physical inactivity and a sedentary lifestyle (see TABLE 1). A sedentary lifestyle has recently been recognized as a major public health issue since it represents one of the main risk factors for mortality linked to non-communicable diseases (Stamatakis et al., 2019).

First studied in adults, a sedentary lifestyle has been shown to be associated with deterioration in cardiovascular and metabolic health, even for those who meet physical activity guidelines (Biswas A, 2015).

Recently, the World Health Organization (WHO) reported an association between sedentary behaviours and physical and mental health problems in children and adolescents: increased adiposity, impaired cardiometabolic and physical health, lower quality social interaction and reduced sleep duration (WHO, 2020).

"Sedentariness is now established as a risk factor for health, independently of the practice of physical activity. In Quebec, nearly a third of the population is considered sedentary."

- Taken from the article *Un aperçu* d'ensemble des revues systématiques quant à l'efficacité des interventions visant les comportements sédentaires, INSPQ, 2022.¹

A brand new systematic review, led by the Sedentary Behaviour Research Network (SBRN), has confirmed that excessive time spent in sedentary behaviours can negatively affect the health and well-being of young people (Kuzik, N., da Costa, B.G et al., 2022). In addition, worldwide, it is currently estimated that young people accumulate **8 hours per day of sedentary time** (Bauman AE et al., 2018), the equivalent of 50% of their waking time. Moreover, a recent meta-analysis carried out among children and adolescents in the United States reports that they spend an average of 63% of the time spent at school in sedentary mode (Egan CA. et al., 2019).

¹ Free translation of online document: https://www.inspq.qc.ca/saine-alimentation-mode-vie-actif/veille-scientifique/juin-2022. Complete reference: Lam K, Baurecht H, Pahmeier K, Niemann A, Romberg C, Biermann-Stallwitz J, Neusser S, Wasem J, Mugler N, Welker C, Leitzmann M, Jochem C. (2022). How effective and how expensive are interventions to reduce sedentary behavior? An umbrella review and meta-analysis (link is external). Obesity Reviews. 23(5):e13422.

TABLE 1

Distinction between sedentary behaviour and physical inactivity²

SEDENTARY BEHAVIOUR

Any awake behaviour that involves very low energy expenditure while sitting, reclined or lying down (e.g. sitting, reading, watching television) (Tremblay et al., 2017)

Examples for children and adolescents (5 to 17 years old), as well as adults (≥ 18 years old): Use of electronic devices (television, computer, tablet, mobile phone, video games) while sitting or lying down; reading/writing/drawing while seated; seated homework; sitting in school; sitting in a bus or car.



PHYSICAL INACTIVITY

Insufficient level of physical activity to meet current physical activity recommendations.

For children and teens (5-17 years): unable to achieve 60 minutes of moderate-intensity (rapid heart rate and breathing) to vigorous (deep, rapid breathing) physical activity daily.



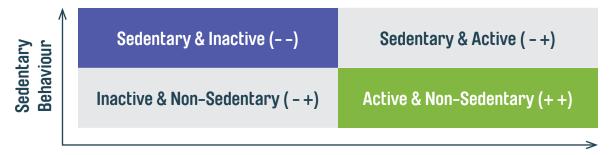
At this time, we do not know the required threshold of time or intensity of physical activity to alleviate the effects of sedentary behaviours in young people, while in adults, studies recommend between 60 and 75 minutes of moderate physical activity on a daily basis³. What we do know, however, is that for all ages, the most beneficial behaviour is to adopt a physically active and non-sedentary lifestyle since the combination of sedentary and inactive proves to be the most detrimental for physical and mental health (See TABLE 2).

² Definitions and examples taken from: https://www.sedentarybehaviour.org/sbrn-terminology-consensus-project/#consensus-definitions

³ "Recent studies show that to reduce or even eliminate the risks associated with prolonged sitting, adults should incorporate a large dose of physical activity into their daily lives (60 to 75 minutes at moderate intensity)" (Ekelund et al., 2019; Ekelund et al., 2016). Unfortunately, a large proportion of Canadian adults (82.5%) do not meet physical activity guidelines (150 minutes of moderate-to-vigorous-intensity physical activity per week or 75 minutes of moderate-intensity physical activity vigorous per week or an equivalent combination of moderate- and vigorous-intensity activity) and are sedentary for most of the day (9.6 hours) (Public Health Agency of Canada, 2018)." Free translation of excerpts taken from *Guide des réunions actives: Notions utiles et conseils pratiques, Mon équilibre UL*, Université Laval 2020.

TABLE 2

Different combinations of physical activity and sedentary behaviour and the positive or negative effects on health



Physical Activity

Did you know that we can be both active and sedentary?



For example, a student may be enrolled in a sport-étude program and play sports at school 5 times a week, but remain in an uninterrupted sitting position during schoolwork and free time for long hours (e.g. watching videos on a screen). In other words, even if a young person achieves the recommended 60 minutes of physical activity per day, he is not necessarily immune to the risks associated with a sedentary lifestyle.

A simple way to adopt a non-sedentary lifestyle, which is recommended in the workplace for adults, is to regularly interrupt the static and prolonged sitting position by standing up, then stretching, taking a few steps or even better by doing a few minutes of light to moderate physical activity⁴. Is it possible to think about integrating this practice for young people at school?

⁴ Proposal inspired by the Guide des réunions actives: Notions utiles et conseils pratiques, Mon équilibre UL, Université Laval 2021.

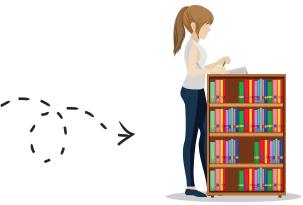
Why target sedentarity in school settings?

A FEW GOOD REASONS TO START:

Data indicates that children are on average 6 hours a day in school (Rush E, Coppinger T, Obolonkin V, et al., 2012) **and most of their day is spent sedentary** (Kuzik, N., da Costa, B.G et al., 2022).

"The sedentary lifestyle of young people is associated with an increased risk of early health problems as well as a decrease in cognitive performance. Since children spend at least a third of their waking time in class, school appears to be a relevant context for reducing sedentary lifestyle".

- Taken from the article *Quels sont les effets des bureaux actifs dans les écoles?*, INSPQ, 2022.⁵
- School is the ideal place to reach the vast majority of young people (net school attendance rates worldwide: 89% for children at primary level and 66% for children at secondary level) (UNESCO, 2020).
- The school is recognized as an **important setting for promoting the health and well-being of children**.







⁵ Free translation of the article, accessed on September 15, 2022: https://www.inspq.qc.ca/veille-scientifique-saine-alimentation-mode-vie-actif/mars-2022.
Complete reference: Guirado, T., Chambonnière, C., Chaput, J.-P., Metz, L., Thivel, D. et Duclos, M. (janvier 2021). "Effects of Classroom Active Desks on Children and Adolescents' Physical Activity, Sedentary Behavior, Academic Achievements and Overall Health: A Systematic Review "(external link), International Journal of Environmental Research and Public Health, vol. 18, n° 6, p. 2828.

The concern for health in the school environment.

In the past...

As a reminder, in the early 2000s, the ministère de l'Éducation, du Loisir et du Sport (MELS) wanted to contribute to the Plan d'action gouvernemental de promotion des saines habitudes de vie et de prévention des problèmes reliés au poids 2006-2012, Investir pour l'avenir with the publication of the Framework Policy on Healthy Eating and Active Living (Going the Healthy Route at School, 2007). It is therefore recognized that the acquisition of healthy lifestyle habits is favorable to educational success and to the full personal and social development of the young person: "[...] The document acknowledges that **the regular practice of physical activities promotes concentration**, a factor related to academic success. Also, since school is a place of training and transmission of values, the health of young people and their lifestyles must be a real concern for the education network." Minsitère de l'Éducation, du Loisir et du Sport (MELS, 2007).

And the present...

"Schools can play a critical role in improving student health and well-being by managing school-related sedentary behaviour and screen use. To understand and address this challenge, the Sedentary Behaviour Research Network released the world's first evidence-based recommendations focused specifically on school-related sedentary behaviour."

- Taken from the website Reducing Sedentary Behaviour, PHE Canada, 20226



"Regular physical activity, increasing PE (physical education) and active classrooms not only protect schoolchildren's health but also improve their academic achievement" (WHO Europe 2021).



⁶ Web page https://phecanada.ca/activate/sedentary-behaviour accessed September 15, 2022.

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"Motivating and enabling school students to get enough exercise with healthy physical activities is an important, fundamental duty of schools in the scope of the sustainable prevention of MSDs (musculoskeletal diseases). It is also important that they perform seated work as rarely as possible." - Excerpt from Better Schools by Promoting Musculoskeletal Health, in the report made by the European Agency for Safety and Health at Work?

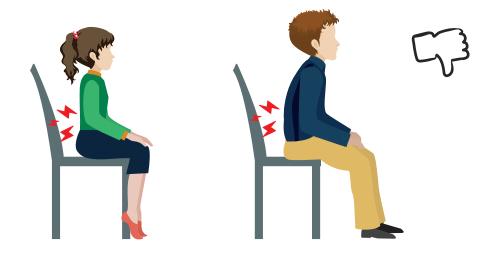
Musculoskeletal disorders (MSDs)8...

A problem in children and adolescents?

"A more recent German study concluded that musculoskeletal problems such as back pain are extremely common. Every sixth child is given such a diagnosis at least once a year. This makes MSDs the eighth most common type of disease in childhood and adolescence (Greiner, Bartram & Witte 2019, 24)."

A problem in teachers?

"Some surveys and scientific studies report an even higher percentage of teachers suffering from MSDs. Taylor cites a percentage of up to 95 percent; 85 percent of younger teachers experience skeletal and muscular pain once per week, but only 8 percent report this to their employers (Taylor 2020b). In particular, the following are cited as causes for MSDs in teachers: unfavorable working posture (such as sitting too long), lack of exercise, a working environment that is detrimental to health, especially due to insufficient ergonomic equipment, unfavourable lighting conditions, poor air quality and noise (Taylor 2020b)."



Better Schools by Promoting Musculoskeletal Health A strategic approach for promoting exercise and preventing MSDs in schools Report, European Agency for Safety and Health at Work (EU-OSHA), 2022.

⁸ Idem.

Various interventions were introduced in the school environment, in addition to periods of physical education and health courses, in order to increase the level of physical activity of young people outside class hours or in class (extracurricular sports activities, development or rearrangement and animation of schoolyards, active breaks, etc.). Even today, the Government of Quebec continues to encourage the practice of physical and sporting activity in schools using the following incentives: Measure 15023 – À l'école, on bouge!9 (physical activities in school) at primary level, Measure 15028 - Extracurricular activities in secondary school¹0 and Measure 50530 – Schoolyard Improvements¹1.

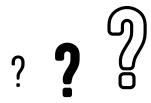
"In Quebec, with the advent of the Lab-school in recent years, several suggestions have emerged in order to review the learning settings. One of the recommendations proposed in the document *Penser l'école de demain* is to "create innovative, interior and external learning spaces, which favour movement".

- Free translation of the online article Quels sont les effets des bureaux actifs dans les écoles?, INSPQ, 2022. "For young students, an amalgam of interventions on the built environment (e.g. active work offices) and the social environment (e.g. parents and teachers) is the most favorable approach for the decrease in sedentary behaviour."

- Free translation of the online article Un aperçu d'ensemble des revues systématiques quant à l'efficacité des interventions visant les comportements sédentaires, INSPQ, 2022.

Since the school is an essential environment for healthy lifestyles, how can we help schools promote the adoption of a physically active and non-sedentary lifestyle among students?

Could the implementation of flexible classrooms be part of the equation?



http://www.education.gouv.qc.ca/fileadmin/site_web/documents/PSG/ress_financieres/rb/21-090-03_RB-CS-21-24-INV-21_v2.pdf

[&]quot;This measure is consistent with the Framework Policy on Healthy Eating and Active Living, the Policy on Physical Activity, Sport and Recreation, the Policy on Educational Success and the Politique gouvernementale de prévention en santé. It is intended to support preschool and elementary school educational institutions, so that all their students are physically active for at least 60 minutes of every school day, including the physical education and health courses listed in the course schedule." Taken from the online document: http://www.education.gouv.qc.ca/fileadmin/site_web/documents/loisir-sport/Doc_info_mesure_15023_22.pdf

[&]quot;The measure aims to support secondary education establishments so that they offer a diversified programming of extracurricular activities to all of their students, promoting regular physical activities, pleasure, satisfaction, accomplishment and the development of the feeling of belonging to school, with the aim of promoting participation, and creating a stimulating living environment conducive to school perseverance and educational success." Free translation of the online document: http://www.education.gouv.qc.ca/fileadmin/site_web/documents/loisir-sport/Doc_info_mesure_15028_2022.pdf

¹¹ The purpose of this measure is to provide financial support to educational organizations within the framework of schoolyard improvement projects in order to stimulate and make the practice of physical activity among young people safer and contribute to the development of an inclusive lifestyle, in particular to develop social skills. Free translation of the online document, accessed August 2022:

MA classe flexible: A potential solution against sedentary lifestyle and physical inactivity?

The above question was at the heart of the pilot project. The on-site assessment aimed to find an answer by contributing to the development of knowledge on flexible layouts: its possible influences on sedentary behaviour, on the musculoskeletal disorders or discomfort of learners, as well as on educational practices.

The pilot project was developed as part of one of the <u>TIR-SHV</u> de la <u>Capitale-Nationale's projects</u>. Thanks to a strong mobilization of several partners and financial support of the TIR-SHV de la Capitale-Nationale over the course of three years (2020, 2021 and 2022), as well as the MÉQ and the MSSS, a team was formed to review the implementation of an already existing program: <u>MA classe flexible</u>. in primary and secondary schools from the Quebec and Chaudière-Appalanches area.

MA classe flexible Program:

In response to the school community's request and drawing inspiration from the "flexible seating" movement (created in the United States mainly in primary schools), professionals from the physically active lifestyle area (kinesiologists, primary and secondary school teachers and P.E. teachers) of the Réseau du sport étudiant du Québec - Québec et Chaudière-Appalaches (RSEQ-QCA) have developed in collaboration with educational advisers and an ergonomist the MA classe flexible Program (Letters M and A meaning Movement and Apprentissage (learning)).

The program relies on a training and support approach, combining several actions related to the modification of the physical layout of the classrooms, the use of a variety of educational practices and ergonomic work postures, while aiming at the decrease in sedentary time of students. In the five years since its launch, more than 200 teachers from primary and secondary schools have been trained and accompanied by the Hourra! Team.

It should be noted that the *MA classe flexible* Program is, to our knowledge, the only program that brings together elements from recent publications for school communities: *International School-Related Sedentary Behaviour Recommendations*¹² made by the Sedentary Behaviour Research Network (SBRN, 2022), *Better Schools by Promoting Musculoskeletal Health*, of the report drawn up by the European Agency for Safety and Health at Work (EU-OSHA, 2022)

and L'aménagement flexible des classes au Québec: une étude descriptive (Bluteau J., et al., 2022).



¹² Taken from: https://www.sedentarybehaviour.org/school-related-sedentary-behaviour-recommendations/

The observations made by the review team made it possible to conclude that, overall, the primary and secondary levels students in flexible classrooms would move and change positions more often (on the ground, traditional seats, dynamic seats and standing work area) that those of students in traditional classrooms, who work most of the time sitting at their respective desks. As for the accelerometry measures, they demonstrated that during school hours (including recess and lunchtime) the time spent in moderate physical activity (MPA) and the number of steps in students from flexible classrooms were much higher than those in traditional classrooms. These latest measures also tell us that the layout is not the only influential factor. Teaching practices*, the teachers' goals, the use of unconventional spaces such as hallways or the school yard and the addition of active breaks are other examples which, in flexible classrooms, increase physical activity and/or reduce students' seated time. It should be noted that some of these elements listed could very well be applied in a more traditional classroom.

*For the needs of the project review and for comparative purposes, in particular between the two types of classrooms (flexible and traditional), teachers were asked to integrate teaching practices in French (reading and dictation) and in mathematics (mathematical jogging) during the first visit and more broadly in writing and resolution of mathematical problems during the second visit. The only difference between the 2 types of classrooms: the flexible classrooms had to use each of the items delivered beforehand at least once (2 oscillating benches, a yoga carpet and an erasable whiteboard in the form of a giant Post-it).

What is accelerometry?

"Accelerometry makes it possible to assess the physical activity of subjects from the mechanical measurements of movements. Indeed, the movements of the torso and the limbs will induce accelerations that can be measured through sensors. [...] The accelerations or decelerations registered provide a description of the frequency, time and intensity of the physical activity produced by body movement." - Free translation taken from Quantification de l'activité physique par l'accélérométrie, Revue d'Épidémiologie et de Santé Publique¹³







¹³ Quantification de l'activité physique par l'accélérométrie, Revue d'Épidémiologie et de Santé Publique, Volume 67, Issue 2, April 2019, Pages 126-134. Revue d'Épidémiologie et de Santé Publique. Article accessed online September 23, 2022: https://www.sciencedirect.com/science/article/abs/pii/S0398762018314858.

Thus, the assessment results of the pilot project combined with recent scientific data suggest that the implementation of flexible classrooms is a promising avenue to reduce the sedentary behaviour of students and to integrate more movement into their daily lives.

The next sections will allow us to know how to go from theory to best practices, in order to make the learning environment more flexible.

The findings drawn from the article *Quels sont les effets des bureaux actifs dans les écoles*?, INSPQ, 2022, support data on the use of "active" offices to stimulate the student movement in a classroom setting:

- "Vertical desks and cycle desks would allow a decrease in sedentary behaviour in a school context and an increase in daily energy expenditure;
- "Active" desks could have positive effects on cognitive performance, among other things, on reaction time and attention span;
- No study reports deleterious effects on cognitive or academic capacities."

The data drawn from a recent **exploratory type review**¹⁴ state that:

- All studies whose interventions have led to partial or complete modifications
 of the classrooms to make flexible arrangements have measured a decrease
 in sedentary behaviour (e.g.: sedentary behaviour in itself or decrease in seated
 time).
- Some studies have also measured an increase in standing time and an increase in the practice of moderate to vigorous physical activity (MVPA).

"Furthermore, the flexible layout of classrooms, particularly with regard to furniture, would help promote dynamic postures in addition to being a promising intervention to reduce sedentary time."

- Free translation taken from *Aménager des écoles favorables à la santé et au bien-être*, INSPQ, 2021.¹⁵

¹⁴ Impact of ergonomic flexible learning spaces in school on sedentary behaviors and learning in youth: A scoping review [revue en cours de rédaction, sous réserve de modification]

¹⁵ Document consulté le 15 septembre 2022: https://www.inspq.gc.ca/sites/default/files/publications/2794-amenager-ecoles-favorables-sante-bien-etre.pdf

What is a flexible learning environment?

Flexible layout refers to a modification of the physical space of the classroom, as well as a modification of teaching practices, in order to harmonize the learning environment to the needs of today's learners (Delzer, 2016; LAQUERRE, G. 2018, Katharina E. Kariippanon et al., 2021; J.Bluteau, 2022). Wanting to stand out from the more traditional classroom model (mainly lecture course and desks in rows or work islands facing the teacher), the flexible layout offers different options of work or listening postures (seated, standing, lying down) (J. Bluteau, 2022), which allows teachers to adopt flexible, differentiated and more student-centered educational practices (J. Bluteau, 2022). In addition, this makes it possible to offer students the opportunity to vary their postures regularly, while trying to offer the most ergonomic stations possible.



"Flexible pedagogy is to teach using a differentiated pedagogy, focused on the needs of students, and to use the flexibility of the environment to adapt pedagogy. There are configurations and workspaces allowing movement, and more posture options (seated, standing, lying down) than students, what is called "seatings".

what is called "seatings". Free translation - J. Bluteau, 2022 "The organization of time and space must be flexible: it is the joint responsibility of the teacher and the student."

- Citation de Carl Rogers (1969), Freedom to Learn for the 80's, cité par Denis Simard (2017) professeur en sciences éducation à l'Université Laval dans Le goût d'apprendre. Une valeur à partager. - Free translation taken from L'ABC de Schola 2021

Remember: there is not only one formula to create a flexible learning environment adapted to both students and teachers! It is a combination of various means that will result in a dynamic and motivating environment so that students are engaged actively, as much as physically in their learning. All classroom models can be flexible when we change the layout as needed (even by keeping a desk per student), that we vary the teaching devices and that we favor the integration of various movement opportunities.

The ideas shared in this document are mainly developed for classroom usage, but could also be used elsewhere in school and expanded to all learning areas including those around school (e.g. in hallways, at the gymnasium or the auditorium, in the schoolyard or other outdoor spaces nearby).

"To meet this objective of creating an optimal learning environment favorable to the well-being of students, the flexible classroom is based on five foundations: the choice (1), the movement (2), the comfort (3), life in community (4) and cooperation (5) (Havig, 2017; Lacquerre, 2018; Limpert, 2017)"

- Free translation taken from *L'aménagement flexible des classes au Québec: une étude descriptive*. J. Bluteau, et al., 2022.

There are indeed several ways to design a flexible classroom...

Definition of a flexible class for descriptive study purposes (L'aménagement flexible des classes au Québec) by Jonathan Bluteau (free translation):

"A flexible layout includes removing the desks and chairs organized in rows in a traditional classroom setting, in order to leave more space on the floor, different work surfaces and different types of seats that students can choose freely. Students can be: lying on the ground or on a carpet; Sitting on the floor, on a cushion or on a Bean Bag; Sitting on chairs with different shapes, on a stool or on a Swiss ball; Standing in front of a high table; alone or in teams, etc. The layout has at least three different seating types as well as movable and modular bookshelves. Students' school supplies are stored in accessible individual boxes or cubicles. There are group and individual work areas, reading and rest areas, entertainment or creativity areas."

* Please note that "out of the 475 answers received on this questionnaire, 26% (n = 124) said that their class did not correspond to the definition. [...] This result could indicate that the proposed definition did not correspond precisely to what teachers consider as a flexible classroom."



TO CONSIDER BEFORE implementing flexible classrooms

This section presents some tips for school administrations and teachers to support their reflections and to guide its planning:

FOR SCHOOL ADMINISTRATION:

- Share convincing data related to the importance of being active and non-sedentary to the entire school team
- Include the decrease in sedentary behaviour and/or the increase in physical activity in the school's educational project
- Make the long -term health of students a priority
- Support and guide staff in their practice change
- Favor a participatory approach rather than imposing change (several options exist)
- Inform teachers of the available budget
- Inform teachers of available resources (material resources and support from educational advisers)
- Keep in mind the concepts of ergonomics cited later in this document during furniture replacement or purchase
- Validate the need for training and support (see Professional Services Needs section)

Some challenges on flexible classroom implementation

"Although the answers we received are unanimous on the benefits of teaching in a flexible classroom layout setting, some mention challenges they had to overcome. First, the functioning of this type of classroom differs from the traditional classroom, an adaptation period is therefore necessary, both for teachers and for students. The availability of suitable equipment is also an obstacle. Teachers recommend providing training and are requesting their school management's support." - Free translation taken from L'aménagement flexible des classes au Québec: une étude descriptive.

J. Bluteau

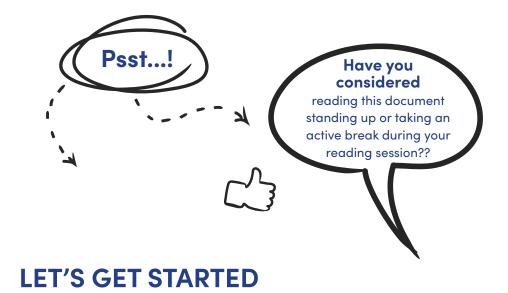
FOR TEACHERS:

- Inform the school administration and parents of the reasons that motivate you to set up a flexible classroom (Share convincing data)
- Target the objectives of your environment change (need to change / adapt to the clientele / need to move / decrease sedentary behaviour, favor autonomy, etc.)
- Validate the available budget, if applicable
- Consult colleagues and/or material resources to make a list of equipment to add, remove or change
- Make a plan of the changes to be made in the classroom so that the transition is made gradually (e.g. start by adding standing work only)
- Think about the ways to maximize the available space (e.g. remove posters to have more wall space during standing work or place the desks in work islands, use the boards, walls, windows and the bookshelves as workspaces)
- Involve students in the reflection, implementation and assessment of the project
- Find other colleagues with whom to share ideas and plan activities (networking and sharing of experience)
- Find out of the resources available for support or guidance (see section to go further)

"In Quebec, there are no official statistics about the establishment of flexible classrooms or innovative layouts, but this number can be estimated at more than 2000 on the territory (in all CSS and private schools from Quebec, primary and secondary). In addition, their implementation typically stems from personal initiatives made by the teachers themselves, with the agreement of their school management."

- Free translation taken from L'aménagement flexible des classes au Québec: une étude descriptive. J. Bluteau





The following section offers a variety of actions allowing the implementation of a flexible class-room. Even if the three are all interrelated, the actions are presented separately in three segments, the physical space layout, the different teaching practices and finally, ergonomics.

1. SETTING UP A FLEXIBLE LAYOUT:

BY OFFERING A VARIETY OF SEATS AND WORK AREAS. *Make sure you have more available places than students.

In light of the review of the pilot project *MA classe flexible*, data gathered through observation highlighted that a greater variety of types of seats and work surfaces were used in flexible classrooms, especially at the primary level. Even if they are identified as traditional classrooms, they do not always have only chairs and desks. TABLE 3 contains a list of furniture and equipment found in the participating classes and can serve as a starting point if you want to experiment with different equipment.

TABLE 3

Different types of seats and work surfaces observed during the pilot project

	Primai	ry level	Secondary level		
Types of seats and work surfaces	Traditional classrooms	Flexible classrooms	Traditional classrooms	Flexible classrooms	
On the ground	Yoga mats	Yoga Mats Cushions Foam mats Ray Lax chairs Surf chairs	Yoga mats	Yoga mats	
Traditional seats and work surfaces	ChairsDesksRectangular tablesStools	ChairsDesksRectangular tablesStools	Chairs Desks	Chairs Desks	
Dynamic seating	Bike deskOscillating benches	 Bike desk Oscillating benches Swiss balls Benches or chairs with wheels Rocking chairs Rocking shells Inflatable discs 	Bike desk	Oscillating benches	

	Prima	ry level	Secondary level		
Types of seats and work surfaces	Traditional classrooms	Flexible classrooms	Traditional classrooms	Flexible classrooms	
Standing Work Surfaces	High tables High desks	 High tables Shelves on the wall Adjustable sit-stand tables Windowsill* Windows* Whiteboard glued to a cupboard Whiteboard* IWB/IBB* 	N/A	Shelves on the wall Small whiteboards fixed to the wall	
Other types of furniture	Couch Reading tent Kidney table	Deckchairs (beach) Adirondack chairs Kidney tables Benches made of milk crates Shelves on the wall Trapezoid tables High chairs Coffee tables Bookcases with communal storage Round tables Reading tent	Reading tent Chairs and coffee tables	N/A	

^{*}These surfaces are also or often present in traditional classrooms and/or secondary level classrooms, but are not used by students for standing work.

In what proportion do we find flexible furniture and equipment (according to 475 teachers in flexible classrooms)? - Information taken from L'aménagement flexible des classes au Québec: une étude descriptive. J. Bluteau, et al., 2022.:

TYPES OF SEATS AND MATERIALS USED



80% cushions



76% stools



72% carpets



61% oscillating stools



53% swiss balls



39% sofas



35% rocking chairs



27% stationary bikes



8% walking exercisers



4% hammocks

FURNITURE



76% low tables



75% work islands



69% high bistro-style tables



37%

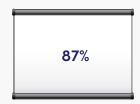
of teachers use dedicated desks for each student, in addition to so-called flexible work surfaces

TECHNOLOGIES

87% → of teachers have an interactive whiteboard in their classroom

55% → use laptops in class

30% → have a desktop computer



55%



DIFFERENT AREAS

(whose function is not for work)

 $70\% \rightarrow$ of teachers have a reading area

47% → a rest area

 $32\% \rightarrow a play area$

BY VARYING THE TYPES OF LAYOUT AND CONFIGURATION.

- Rethink the positioning in the class differently. Here is a site that can inspire you: <u>OrganizedClassroom.com</u>
- Use the walls to write (self-adhesive whiteboard surface, use of green boards, addition of magnetic clips to hold the sheet to the wall, etc.)
- Think about the educational potential of each existing space / furniture (large storage cupboard which also becomes a writing surface, use of the hallways as an extension of the classroom, bookcase whose top becomes a work station for teamwork, etc.)

"The physical environment must be thoughtful and designed to promote the achievement of educational objectives (Carignan, 2018; Wannarka and Ruhl, 2008). It must therefore be mobile, flexible and scalable according to educational requirements and needs. (MEES, 2019)" - Free translation from L'aménagement flexible des classes au Québec: une étude descriptive.

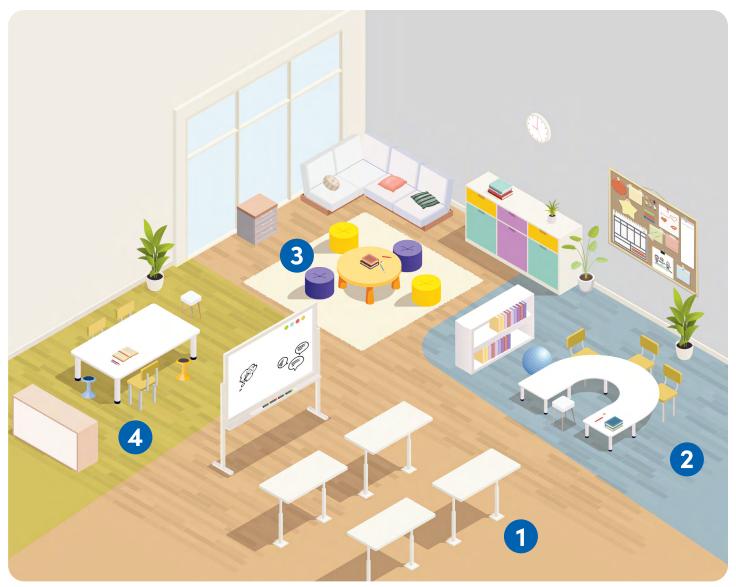
J. Bluteau, et al., 2022.

"The classroom is arranged in spaces adapted to the educational objectives and the types of behaviour expected: reading area, concentration area, collaboration area, evaluation area, etc., and is based on the precept that architecture, layout and pedagogy should be designed to meet the developmental needs of students and create an optimal learning environment (Hébert et Dugas, 2019)."

- Free translation from L'aménagement flexible des classes au Québec: une étude descriptive. J. Bluteau, et al., 2022.

BY SEPARATING THE CLASS INTO AREAS/ STATIONS.

- Think about gathering moments (group communications), individual work (quiet work / zone of concentration and evaluation) or in teams (collaboration zone) when creating the classroom plan.
- Creation of one or more varied reading corners (quiet work / reading area) (under a table, in the hallway, on a couch, on the floor, etc.)
- Rotate stations so that students move around and use them.



*The image is for illustrative purposes only.

- → Standing collaborative work or assembly area
- → Area for sub-groups of need
- 3 → Reading area or quiet area
- 4 → Area for exchange and collaboration

The following table (TABLE 4) demonstrates the differences noted during observations related to the layout usage by primary and secondary level teachers. Among other things, we note the greater use of gathering spaces, cooperation spaces and spaces outside the classroom for the flexible classes of the 2 levels.

TABLE 4
Use of layout/areas in Traditional Classrooms
and Flexible Classrooms

	Primary level		Secondary level	
Elements of the physical environment observed	Traditional	Flexible	Traditional	Flexible
	Class-	Class-	Class-	Class-
	rooms	rooms	rooms	rooms
There is a gathering space for group communications (ex: mats, cushions, etc.)	40%	100 %	0 %	50 %
	(2/5)	(5/5)	(0/2)	(1/2)
There are one or more spaces for cooperative work / teamwork (tables, couch, etc.)	80 %	100 %	0 %	100 %
	(4/5)	(5/5)	(0/2)	(2/2)
There are one or more spaces for quiet work (individual, isolated or set back, reading corner, etc.)	60 %	40 %	0 %	50 %
	(3/5)	(2/5)	(0/2)	(1/2)
The teacher uses spaces other than the classroom (hallway, gymnasium, schoolyard, etc.)	40 %	100 %	0 %	100 %
	(2/5)	(5/5)	(0/2)	(2/2)

BY ADJUSTING THE LAYOUT FOLLOWING THE SURVEY with the preference of the students as well as their feelings about their comfort and their level of performance at each of the stations. Sample surveys are shared in the <u>Practical Tools</u> section.



2. USE FLEXIBLE, ACTIVE AND VARIED TEACHING PRACTICES:

As an inspiration, here are some examples seen in the flexible classes observed:

- 1. use of varied and differentiated pedagogical practices with student-centered projects
- 2. possibility of making choices, in particular the places or postures of work / listening (promote autonomy as much as possible)
- 3. presence of stations to make sub-groups if necessary
- 4. use of active pedagogy (concrete examples that make people want to get involved)
- 5. use of educational and active games (see TABLE 5).

"The environment must be rich and stimulating for the student and raise questions for him"

- Citation de Carl Rogers (1969), *Freedom to Learn for the 80's*, cité par Denis Simard (2017) professeur en sciences éducation à l'Université Laval dans *Le goût d'apprendre*. *Une valeur à partager*. - Free translation from L'ABC de Schola 2021.

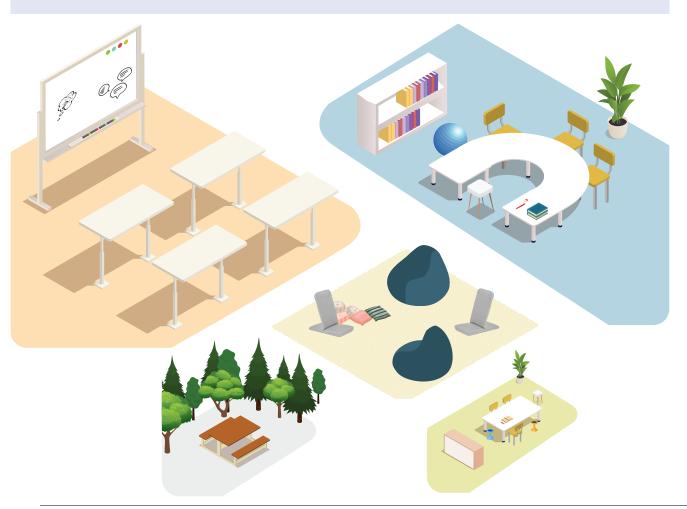


TABLE 5

Examples of educational and active games observed as part of the pilot project

Mathematics	Dictations/writing	Reading	Other ideas
Active mathematical jogging: add stationary movements (each student in their place) between the numbers to stretch.	Display the dictation answer key in the hallway so that students move to look it up.	Adopt a posture of your choice (on the ground, different seats, standing) to read.	Use another room for a new concept or teamwork (e.g. art room).
Correction circle: the students each correct the sheet of a neighbor and at the signal, they go to a new copy for a 2 nd validation, then a 3 rd	Wall dictionary: display common words on sheets installed in different places in the classroom so that students can validate themselves during writing periods.	Read while walking.	Movement according to the nature of the words: each category has its own movement (ex: verb = running on the spot, noun = we change places). The word is named, we spell it as a group and then we move.
Estimating with objects we can find in nature: collecting pine cones and estimating the number, then work as a group to count.	Use of different postures: for dictation, students drawn at random are invited to try new stations (on the cupboard, on the floor, on the sofa, on the bicycle).	Reading outside, lying on the grass.	

Activities observed in secondary level classrooms

- → Cross-color on the school football field (Spanish)
- → Seek and find in Spanish in the classroom or outside
- → Teamwork in the stands of the football field
- → Guess who? Boardgame full size
- → Standing teamwork with removable giant Post-it notes or other writing surfaces on the wall
- → Collaborative work in islets (on the ground, in the hallway)
- → Opportunity to seek information from resource people in the school (outside the classroom) for a writing project

Pedagogical practices should be supported by the physical layout, as demonstrated in TABLE 6 (and TABLE 7 in the *Discover other practical tools* section)

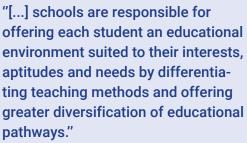
TABLE 6 Stages of Explicit Teaching¹⁶

	Steps				
1. Modelling	The teacher strives to make explicit any implicit reasoning during her presentations and demonstrations by teaching the what, why, how, when and where to do.	\rightarrow	The students must be able to see the teacher, so they need to be facing her		
2. Guided practice (feedback)	The teacher checks what the students have understood from their presentation or demonstration by giving them tasks to carry out, as a team, similar to those carried out during the modelling.	\rightarrow	Students can work 2 by 2 or in teams, the teacher must be able to move easily between the teams		
3. Autonomous practice	The student reinvests on their own what they has understood from modeling and applied as a team, during guided practice, in a few problems or questions.	\rightarrow	The student works alone		

And since there is no single flexible classroom model, here are some other ideas for implementing flexible strategies that do not require any special layout:

Addition of active breaks with or without relevance to the school subjects (time for active breaks deemed effective according to the scientific literature: between 5 and 15 minutes)	Walk outside before a task that requires more concentration in class or before an essay to find inspiration Time limit for sedentary homework (no more than ten minutes per day), by grade level, e.g.
Give permission to students to stand up to listen or to work if they feel the need	no more than 10 minutes per day in Grade 1, or maximum 60 minutes per day in Grade 6
Let students choose their posture during a group discussion	(Taken from SBRN 2022) Ensure screen time at school is meaningful,
Standing snack time	mentally or physically active and serves a
Gathering of students around high tables, bookcases or counters for a team project	specific educational purpose (Taken from SBRN 2022)

¹⁶ Taken from l'ABC de la rénovation scolaire au Québec, Schola, 2021. Tableau 21, source: Adapté Gauthier et Tardif, 2010. p. 115.



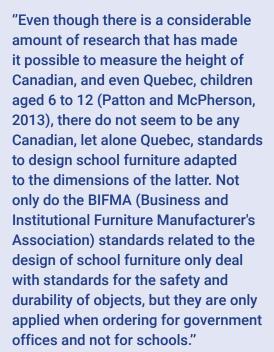
- Free translation from *Politique* de la réussite éducative - Le plaisir d'apprendre, la chance de réussir, 2017.¹⁷

3. ENSURE THE USE OF ERGONOMIC WORKING AND LISTENING POSTURES:

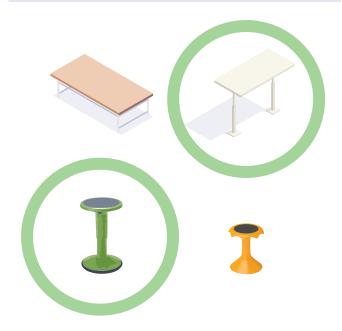
How to ensure that the flexible classroom will be as ergonomic as possible for the comfort and physical health of the students? Some practical tips can be found here:

- adjust the existing furniture as best as possible a few times a year as the students grow
- diversify seat heights and workstations to allow for different postures
- prioritize adjustable furniture when possible

Manufacturing standards!!!



- Free translation from *L'ABC de la* rénovation scolaire au Québec, Schola, 2021.



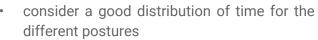
¹⁷ Document accessed online, September 12, 2022: http://www.education.gouv.qc.ca/fileadmin/site_web/documents/PSG/politiques_orientations/politique_reussite_educative_10juillet_F_1.pdf.

- vary the working and listening postures at each period
- take an active break every 30 minutes for ages 5-12 and every 60 minutes for ages 12-17 (Taken from SBRN 2022)
- work more often on the ground and standing (on a wall or a table) because the height is then adaptable for everyone





According to Dr Dieter Breithecker¹⁸: students aged 6 to 10 cannot sit still for more than 5 minutes on average, and those aged 11 to 15 for no more than 15 minutes on average. As for students aged 15 to 20, they cannot remain seated, in a static position, for more than 25 minutes on average!¹⁹



→ **50%** in dynamic sitting;



→ 30% standing (raised desk, high table, wall, blackboard, etc.);



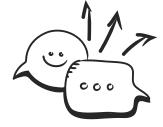


→ 20% traveling (including using teaching methods involving movement, active learning, active breaks)²⁰





 make frequent reminders of good postures (see pictograms in the <u>To Go Further</u> section)





¹⁸ Head of the Institute for Posture and Exercise Development in Germany, and member of "Ergonomics for Children and Educational Environment", a technical committee of the International Ergonomics Association.

Dieter BREITHECKER, "Bodies in Motion, Brains in Motion. Movement makes kids better students." VS Vereinigte Spezialmöbelfabriken 2015, 23 p. Document disponible en ligne: https://www.aquestdesign.ca/docs/45-066-02_V01_EN_Bodies_in_Motion-120602.pdf.

²⁰ Dieter BREITHECKER, op. cit.

In practical health promotion and prevention of MSDs in schools, this means taking care of the following, among other things:

- Supporting teachers in anchoring health-related content in the individual school subjects.
- Ensuring there is relaxation time and physical activity.
- Providing ergonomic workplaces for students and teachers.

"Anyone who suffers from musculoskeletal pain in their childhood or youth is at an increased risk of having these issues as an adult as well. [...] For the prevention of MSDs, it is therefore of fundamental importance to start early, to raise awareness for the topic amongst young people in their early school education and to give them the tools to actively counteract these disorders.."

Better Schools by Promoting Musculoskeletal Health A strategic approach for promoting exercise and preventing MSDs in schools Report, EU-OSHA, 2022.

CONCLUSION

In summary, the school environment seems to be the most appropriate place to facilitate the integration of healthy lifestyle habits into the daily lives of young people. Thus, the results of recent studies and research consulted, in addition to the observations and measures of the pilot project, show that flexible classrooms can really help make students more active and less sedentary in class. Please note that flexibility can be applied in several ways and even beyond the walls of the classroom. **Teachers can therefore implement flexible classrooms thanks to various actions related to an adapted physical layout of the class and a diversification of teaching practices, in particular promoting physically active lessons.** Management can support teachers in their approach, among other things, by facilitating access to varied and ergonomic materials (as much as possible), training and support. With approximately 2,000 flexible classrooms identified across Quebec and the latest conclusive or promising data on the subject, it is our responsibility to continue to pay great attention to this topic in order to improve the response to the needs of students and their well-being.

TO GO FURTHER...

In order to give you as much information as possible to create or improve your flexible learning environment, here are several other relevant resources:

DISCOVER OTHER PRACTICAL TOOLS

Flexible layout:

- Directory of Lab School suppliers
- Schola Web Platform
- MA classe flexible tools Survey of primary and secondary stations
- Use Table 7 to choose a layout, according to pedagogical practices

TABLE 7 Educational activity and its impact on the equipment and organization of the space²¹

Educational activity		Impact on the classroom layout
Lecture:	\rightarrow	Classic classroom setup
learning by transmitting information or by writing	\rightarrow	Projection or interactive whiteboard
	\rightarrow	Group discussion on a production
Constructive criticism: learning through criticism and building on it	\rightarrow	Projection or interactive whiteboard
	\rightarrow	O or U configuration
Simulation:	\rightarrow	Computer work alone or in a team of two
learning through a simulation of a sometimes complex reality	\rightarrow	Option to project on the board from a workstation
Demonstration:	\rightarrow	Work in a team of two
learning by demonstrating	\rightarrow	Support from the teacher

²¹ Taken from L'ABC de la rénovation scolaire au Québec, Schola 2021. Tableau 20: La variété des activités pédagogiques des années 1970 à aujourd'hui, source : Adapté de Ceci et Courdin, 2015. p. 114.

Educational activity	Impact on the classroom layout
	Classic configuration: actors on the board
Role-playing: learning by playing a role	U-shaped configuration: actors in the middle
	→ Large space that can be used as a stage
Practical work (experimentation):	→ Object manipulation spaces
learning by doing	→ Scientific equipment
The project: learning by achieving	Spaces for practical work and manipulation of objects
Case study:	Classic or group configuration
learning from a particular case and generalizing	Research material (library or internet access)
	→ Configuration allowing teamwork of 2, 4 or 6
Problem-based learning: seeking information and solutions	→ Writing surfaces on the walls for each group
	Collective presentation area with screen and projector
Lecture (or peer learning):	→ U-shaped configuration
learning by teaching	→ Projection or interactive whiteboard
Competition:	→ Open space allowing a staging
learning by competing or through a challenge	→ Screen and projector
	→ O or U configuration
Debate (facilitating a discussion group): learning by discussing	→ Comfortable furniture promoting an open attitude
	→ Writing surfaces for taking notes

Teaching practices and active games (Links in French):

- Hourra.ca (4 jeux pédagogiques actifs Pictogramme pour penser à travailler debout Ose la pause)
- Sharing group Facebook MA classe flexible
- Enseigner dehors (Fondation Monique-Fitz-Back)
- At secondary level: <u>Padlet sur la différenciation pédagogique et la pédagogie active de la CP Nancy Harvey</u> (CSS de la Capitale)
- Continuous learning platform: 100 Degrés: <u>Réussir vos jeux actifs en classe</u> et <u>Pédagogie par le</u> jeu
- Games and active breaks on the website L'école bouge (Mouvement Olympiques Suisse)

Ergonomics:

- Pictograms of good postures
- Kit Planet Knowledge by an occupational therapist

PROFESSIONAL SERVICES NEEDS?

- Contact the educational advisers of your CSS
- Contact the <u>MA classe flexible</u> project team (online training and support available)
- Follow the training: cadre 21 pédagogie on flexible layout

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Useful tools

WORKSTATION APPRECIATION CHART²¹

How I feel about the workstations

WORKSTATION	WHY	
WORKSTATION	WHY	

²¹ Adaptation from the document How to Manage Flexible Seating tiré du site Internet Teachers Pay Teachers (https://www.teacherspayteachers.com/Product/How-to-Manage-Flexible-Seating-Freebie-2745559).

	TRIAL 1: Allowed me to	TRIAL 2: Allowed me to	I CAN CONCLUDE THAT THIS WORKSTATION	COMMENTS
	☐ Get to work quickly	☐ Get to work quickly		
STANDING Worksta-	☐ Stay focused on the task	☐ Stay focused on the task		
TION ON THE WALL	Respect the requested deadline	Respect the requested deadline		
	☐ Collaborate with respect	Collaborate with respect		
	□ N/A	□ N/A		

	TRIAL 1: Allowed me to	TRIAL 2: Allowed me to	I CAN CONCLUDE THAT THIS WORKSTATION	COMMENTS
	☐ Get to work quickly	☐ Get to work quickly		
STANDING WORKSTA-	☐ Stay focused on the task	Stay focused on the task		
TION AT THE HIGH TABLE	☐ Respect the requested deadline	Respect the requested deadline		
	☐ Collaborate with respect☐ N/A	☐ Collaborate with respect☐ N/A		

	TRIAL 1: Allowed me to	TRIAL 2: Allowed me to	I CAN CONCLUDE THAT THIS WORKSTATION	COMMENTS
SEATED	☐ Get to work quickly	☐ Get to work quickly		
WORKSTA- TION (BISTRO	Stay focused on the task	Stay focused on the task		
BENCH) AT	Respect the requested deadline	Respect the requested deadline		
TABLE	Collaborate with respect N/A	Collaborate with respect N/A		

	TRIAL 1: Allowed me to	TRIAL 2: Allowed me to	I CAN CONCLUDE THAT THIS WORKSTATION	COMMENTS
SITTING OR	☐ Get to work quickly	☐ Get to work quickly		
KNEELING WORKSTA-	☐ Stay focused on the task	Stay focused on the task		
TION AT THE COFFEE	☐ Respect the requested deadline	Respect the requested deadline		
TABLE	☐ Collaborate with respect ☐ N/A	☐ Collaborate with respect ☐ N/A		

	TRIAL 1: Allowed me to	TRIAL 2: Allowed me to	I CAN CONCLUDE THAT THIS WORKSTATION	COMMENTS
	☐ Get to work quickly	☐ Get to work quickly		
SITTING Worksta-	☐ Stay focused on the task	Stay focused on the task		
TION ON THE COUCH	☐ Respect the requested deadline	Respect the requested deadline		
	Collaborate with respect	Collaborate with respect		
	□ N/A	□ N/A		

	TRIAL 1: Allowed me to	TRIAL 2: Allowed me to	I CAN CONCLUDE THAT THIS WORKSTATION	COMMENTS
SITTING	☐ Get to work quickly	☐ Get to work quickly		
WORKSTA- TION AT A	Stay focused on the task	Stay focused on the task		
DESK ON A Tradition-	☐ Respect the requested deadline	Respect the requested deadline		
AL CHAIR	Collaborate with respect	Collaborate with respect		
	□ N/A	□ N/A		

	TRIAL 1: Allowed me to	TRIAL 2: Allowed me to	I CAN CONCLUDE THAT THIS WORKSTATION	COMMENTS
SITTING	☐ Get to work quickly	☐ Get to work quickly		
WORKSTA- TION AT A	☐ Stay focused on the task	Stay focused on the task		
DESK ON A COMPUTER	☐ Respect the requested deadline	Respect the requested deadline		
CHAIR	☐ Collaborate with respect☐ N/A	☐ Collaborate with respect☐ N/A		

	TRIAL 1: Allowed me to	TRIAL 2: Allowed me to	I CAN CONCLUDE THAT THIS WORKSTATION	COMMENTS
SITTING	☐ Get to work quickly	☐ Get to work quickly		
WORK- Station	☐ Stay focused on the task	☐ Stay focused on the task		
ON THE Ground	Respect the requested deadline	Respect the requested deadline		
(RAY-LAX)	☐ Collaborate with respect☐ N/A	☐ Collaborate with respect ☐ N/A		

	TRIAL 1: Allowed me to	TRIAL 2: Allowed me to	I CAN CONCLUDE THAT THIS WORKSTATION	COMMENTS
	☐ Get to work quickly	☐ Get to work quickly		
LYING WORK-	☐ Stay focused on the task	Stay focused on the task		
STATION ON THE GROUND	Respect the requested deadline	Respect the requested deadline		
UNIOUND	Collaborate with respect	Collaborate with respect	п	
	□ N/A	□ N/A		

TRIAL 1: Allowed me to	TRIAL 2: Allowed me to	I CAN CONCLUDE THAT THIS WORKSTATION	COMMENTS
Get to work quickly	☐ Get to work quickly		
Stay focused on the task	Stay focused on the task		
Respect the requested deadline	Respect the requested deadline		
☐ Collaborate with respect	☐ Collaborate with respect		
□ N/A	□ N/A		

	IN GENERAL, IN MY FLEXIBLE CLASS	PROPOSED SOLUTIONS, IF APPLICABLE
ANADIENT	☐ Helps me concentrate	
AMBIENT NOISE	☐ Bothers me	
HOIOL	☐ Don't change anything for me	
	EN GÉNÉRAL, DANS MA CLASSE FLEXIBLE	PROPOSED SOLUTIONS, IF APPLICABLE
MOVEMENT	☐ Helps me concentrate	
AT WORKSTA-	☐ Bothers me	
TIONS	☐ Don't change anything for me	
	EN GÉNÉRAL, DANS MA CLASSE FLEXIBLE	PROPOSED SOLUTIONS, IF APPLICABLE
TRANSITIONS	☐ Helps me concentrate	
(CHANGE OF WORKSTA-	☐ Bothers me	
TION)	Don't change anything for me	









