

How to use movement & storytelling to improve children's math skills



A PEDAGOGICAL GUIDE



PREPARED BY:



FERMAT SCIENCE
Une autre idée des maths



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MATH&MOVE

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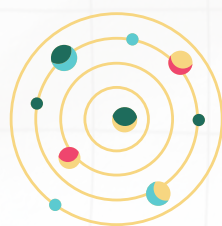
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Introduction to the Math&Move project idea



Traditionally, mathematics has been taught to pupils in the form of isolated rules and procedures, often ones they must memorise and which are disconnected from their everyday lives. Education researchers label the challenge children experience with grasping this approach as ‘**math phobia**’. Math phobia manifests as anxiety and fear which can be so crippling that it interferes with children’s math performance.

The repercussions of this issue are already visible in international student surveys evaluating math achievement, such as the OECD’s PISA. The latest PISA report from 2018 reveals that **in the EU-27 about 23% of 15-year-olds do not reach even basic levels of skills in mathematics and science**¹. More recently, a 2022 Eurydice report further shed light on these findings by underscoring that “**the way in which mathematics and science are taught in schools greatly influences students’ attitudes towards these subjects**, as well as their motivation to study and, consequently, their achievement.”²



Against this background, we’ve launched the Math&Move project, bringing together countries from different regions of Europe (Belgium, France, Greece and Serbia) with the purpose of targeting math-related anxiety and underachievement by applying an innovative teaching method that is accessible to teachers and their pupils.

OUR METHODOLOGY & RESOURCES

The Math&Move project has developed a methodology to help children better **identify with abstract mathematical content by putting it in context through movement and storytelling**. Combining movement and storytelling to make math more relatable to our target group – children ages 6-9 – is a **multidisciplinary approach** that provides an engaging alternative to uninspired math instruction because it targets different intelligences: **visual-spatial, linguistic-verbal, logical-mathematical, bodily-kinesthetic and others**. As such, it can reach a diverse set of learners who have been less responsive to traditional techniques, opening the door to an overall **increase in pupil engagement and motivation** for learning math.



¹ OECD, PISA 2018 Results (Volume I).

² European Commission, “Increasing Achievement and Motivation in Mathematics and Science Learning in Schools.”

Math&Move will incorporate movement and storytelling into mathematical content by applying the following project resources:



Math lessons involving movement

These lessons present math concepts through kinesthetic techniques. They contain explanations for pupils on how to move their bodies to comprehend seemingly abstract ideas. Each lesson includes adaptations and options for pupils operating in different learning environments, such as dys-disordered learners. The lessons are enriched with dynamic practice sheets that invite pupils to practice movements individually or collaboratively, as well as videos intended for digital and visual support to demonstrate the movements.

These e-books introduce the math notions contained in the math lessons by using stories. The stories ensure that the kinesthetic movements presented to children are reinforced with a storytelling approach, further activating their imaginations.



Story e-books

Prioritising the inclusion of children with special needs



According to PISA testing results, **underperformance in math is especially prevalent among pupils with socioeconomic disadvantages and those with math-related learning disorders**, such as dyscalculia. This is why the Math&Move project strives to ensure that a wide scope of learners can benefit from our resources. The inclusion of these pupils has been prioritised by our project methodology in the following ways:

- **Guaranteeing accessibility of project results with the design of our resources** and the content contained within them (for example, suggesting alternative movements to account for learners with physical limitations or those that are coordination-challenged and require movements that are easier to replicate/follow)
- **Providing all materials for free**, including the e-books which will contain introductory stories about the kinaesthetic math lessons. In this way, they are applicable for use not only in the context of formal education, but also at home with families and friends.




Overview of the guide

After this Introduction, the guide will acquaint readers with **teaching and learning math using kinaesthetic learning resources**. It will, first, cover their use in class, including how to prepare pupils for the activity and some good practices within our partnership with applying this strategy. Then, it will provide guidance for parents on the use of kinaesthetic learning at home. Finally, it will elaborate on how you can adapt kinaesthetic learning resources for children with Specific Learning Disorders and those from disadvantaged backgrounds.

The third chapter follows the same structure as the second, but it focuses on **the use of storytelling resources at school and at home**. After providing guidance on good practices for teachers and parents, this chapter will also conclude with adaptations for supporting pupils with special needs.

The fourth chapter discusses the project's multidisciplinary approach, first tackling the **benefits of combining movement with storytelling for improving math skills**, and then concluding with **the potential this approach can have beyond math skills acquisition**. The conclusion will summarise the main points covered in the guide, after which readers can turn to the bibliography for further reading.





Teaching and learning math with kinaesthetic learning resources



Everyone learns differently. According to studies, there are different learning styles with three being the most popular ones: **visual, auditory, and kinaesthetic**³. Every person's brain is different, so it makes sense that the way we process information isn't the same either. **Kinaesthetic learning** is an example of this and refers to people who **learn best through physical activity**. Individuals that respond best to **kinaesthetic strategies** learn best with an active "**hands-on**" approach. They favour interaction with the physical world. Most of the time kinaesthetic learners have a difficult time paying attention and can become unfocused effortlessly⁴.

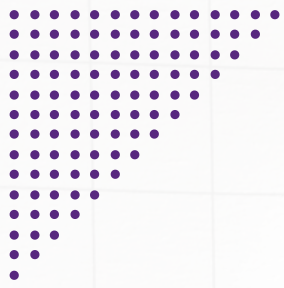
Howard Gardner's multiple intelligences theory (MIT) identified 8 different intelligences. This had a massive impact on the way people looked at education, as it acknowledges the complexities of intelligence, and validated learning in different ways. This doesn't mean that people could only fit into one of these categories. On the contrary, Gardner's theory is about **empowering people to think about how they learn and embrace their abilities as individuals**. Gardner recommends that teachers use a wide variety of ways to deal with the subject because "genuine understanding is most likely to emerge and be apparent to others"⁵.

To tackle this type of learning, the project is developing its own kinaesthetic resources incorporating movements, practice sheets to give practical advice on how to implement them in the classroom and at home and complementary videos to provide visual support.

³ Pourhosein Gilakjani, "Visual, Auditory, Kinaesthetic Learning Styles and Their Impacts on English Language Teaching."

⁴ Pourhosein Gilakjani.

⁵ Mora, "Gardner's Theory of Multiple Intelligences (8 Types of Intelligences)."



Using kinaesthetic learning resources with pupils in class

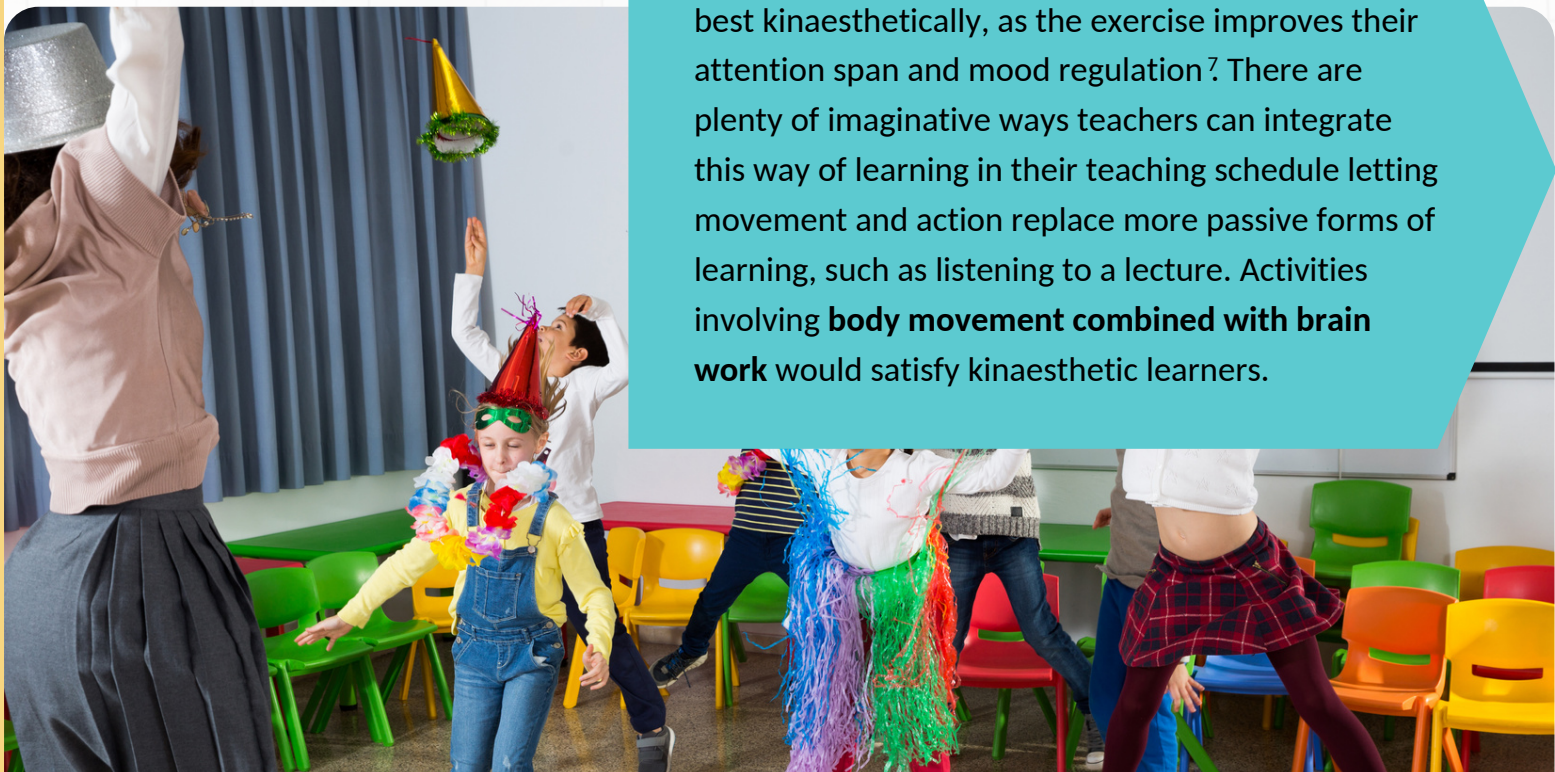


It is common knowledge that pupils struggle to learn math using traditional teaching methods. Rote memorisation and practice problems take individual math topics out of context and make later math concepts more confusing. What is more, pupils' excessive energy reduces their ability to focus in class, especially if they have been diagnosed with ADHD. But there are teaching techniques, like those suggested in this guide, that take advantage of these circumstances to help pupils understand math. **Kinaesthetic learning** is an asset for teachers, educators, even parents, as it uses physical activity to teach and engage pupils with the classroom material.

HOW TO PREPARE YOUR PUPILS FOR KINAESTHETIC LEARNING

There is a lot to gain from using **kinaesthetic learning techniques** in the classroom. By integrating exercise with learning cortical mass, blood flow, and oxygen delivered to the brain are all being increased. The number of pathways created between neurons in the brain are also increased by physical activity, which in turn improves cognition and retention⁶. When pupils learn math through movement, games, and activities, they begin solving problems more creatively. The exercise they get from **kinaesthetic math games** helps them **focus and retain new classroom content**.

Pupils with learning disorders such as ADHD learn best kinaesthetically, as the exercise improves their attention span and mood regulation⁷. There are plenty of imaginative ways teachers can integrate this way of learning in their teaching schedule letting movement and action replace more passive forms of learning, such as listening to a lecture. Activities involving **body movement combined with brain work** would satisfy kinaesthetic learners.

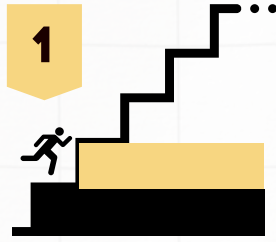


⁶ "Kinesthetic Learning in the Classroom."

⁷ "What Is Kinaesthetic Learning?"



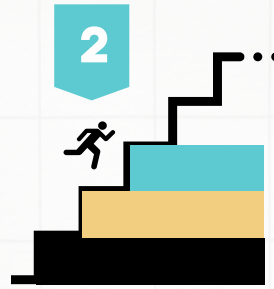
KINAESTHETIC LEARNING TIPS FOR TEACHERS



1

Let kinaesthetic learners be physically active during a lesson;

when pupils must sit for long, uninterrupted periods, rest breaks may help foster better attention.



2

Use many media sources (video, images, audio) together with interactivity,

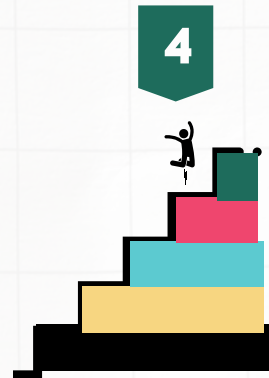
using technology where possible (such as using whiteboards to encourage participation).



3

Attempt to provide a physical/ practical element to your lessons.

These could include: demonstrations; dance; body games; projects; science labs.



4

Make use of kinaesthetic learner-friendly tools, which include:

drawing materials; puzzles; blocks and cubes; felt boards; wooden numbers and letters; modelling clay; number lines.



Teachers should be well-prepared beforehand to emphasise their pupils' strengths to make them feel confident enough and consequently achieve success in the classroom.



MATH KINAESTHETIC ACTIVITIES

When pupils work on math-related projects, they become better at solving math problems while having fun. An alternative math approach could include:

- **Creating models** using various materials (e.g. a clock out of paper plates to learn or practice the time /make a pizza out of construction paper and use the "slices" to visualise the fraction concepts)
- Bring in class **mathematical tools**, such as an abacus or protractors
- **Tapping, snapping fingers or clapping** to show numbers' relation or sequence (e.g.the teacher claps out a rhythm, children imitate)
- Playing **board/guessing games** (e.g. estimate the weight or height of classroom objects and then measure to check; dominoes)
- Combining sports and math activities (e.g. math hopscotch)
- Incorporating dance and music with math studies
- **Riddles, puzzles and brain-teasers** are more exciting and fun than a traditional math word problem



Cards & dice



Reaching out to kinaesthetic learners does not have to stretch the school's budget. Inexpensive items such as **regular playing cards and dice** can serve as learning tools. Pupils review addition and multiplication facts by dealing two regular playing cards and performing mathematical operations on the numbers found on the cards. Dice can be used in much the same way.



Flashcards



Flash cards can often be easily found in any elementary classroom, and allow kinaesthetically-oriented pupils a chance for motion.



Using manipulatives



They are objects that can be handled to enhance the math experience and vary depending on the math level. **Manipulatives** include blocks and number lines for counting and performing simple math operations; spinners, marbles and double-sided counters to practice probability and ratios; clocks for telling time; and fake paper money and coins for units on counting and changing money. Using manipulatives abstract mathematical concepts are transformed into concrete activities.



Computer time



Pupils always enjoy time on the computer. Since almost every modern classroom is equipped with a computer and internet access, computer time can be effective during a math lesson. Bookmark **math websites** that allow pupils to play interactive games corresponding to your math lesson.



Food Math



Bring in **fruits** such as apples, pears and oranges to introduce lessons on fractions. Demonstrate fractions by cutting different portions of the fruit into common fractions, such as: halves, thirds, quarters, fifths, sixths. A **pizza party or pie tasting** can equally work. Split the pizzas or pies into various sections to review fraction concepts with your pupils before allowing them to consume the food.



Scavenger hunt



Let your class **run wild during math time**. With lessons on two or three-dimensional shapes, engage your pupils in a classroom treasure hunt. After ensuring your pupils have become familiar with each of the shapes in your lesson, provide them with a list of shapes you want pupils to find within the classroom. This activity gets your pupils moving, touching objects and exploring shapes in a tangible way.



Act it out

Arguably, one of the **most difficult areas for pupils in math is solving word problems**. Although word problems should reflect real-world mathematical conundrums, many of the word problems seen in textbooks mean nothing to the pupil. Have groups of pupils come up with short, why not humorous, sketches in which they act out a mathematical problem and solution related to their knowledge of the world and the concept being studied. For example, to illustrate the concept of subtraction, pupils can perform a sketch in which they borrow or exchange supplies from one another. This strategy gets pupils out of their chairs, translates words into actions, and draws relationships between math and pupils' everyday lives.



Math can be a challenging subject for pupils, frequently resulting in mathphobia. However, engaging pupils in “smart” math projects can facilitate the learning process and boost their confidence.

Partnership good practices in applying kinaesthetic learning strategies in class

Here are some good practices, suggested by project members, in applying kinaesthetic learning strategies in class **to develop better and deeper math understanding**. Kinaesthetic learners need to perform interactive activities to understand new concepts. They thrive while working on hands-on projects. Technology offers many ways of accommodating this learning style. **Interactive whiteboards** in the classroom can be used for a wide variety of applications and educational purposes. They have been proven to encourage a more interactive and engaging learning experience. **Primary school pupils tend to have relatively low attention spans**—smart boards offer a myriad of opportunities to keep pupils engaged through interactive features.

An interactive whiteboard accommodates a variety of learning styles where traditional education tools are often quite limiting. With an interactive whiteboard, primary school pupils **can learn in away that best fits them**. A smartboard provides access to tools and materials for audio, visual, and kinetic learners to get the most out of each classroom lesson.

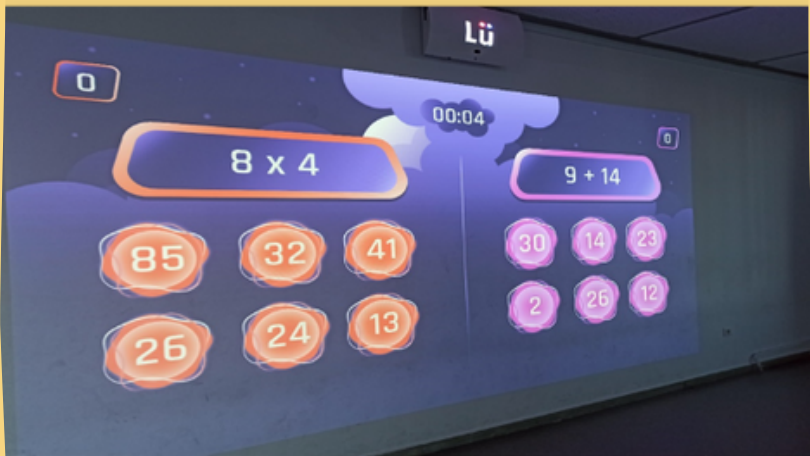




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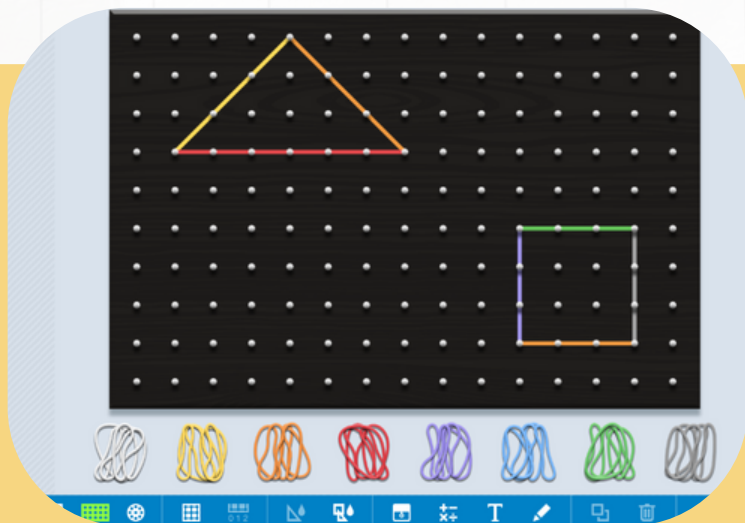
LU Playground is an interactive audiovisual system powered by a wide range of educational applications suitable for pedagogical uses. LU applications cover all subject matters from Math to STEM and more.

Many schools strengthen the mastery of mathematical concepts by cultivating the pupils' **mathematical thinking** in all classes alongside the traditional way of teaching math. This way all types of learners **find their place in classroom, cooperation between pupils is promoted and they feel confident in their mathematical abilities**. By solving riddles and math quizzes, they try to approach and interpret mathematical concepts and problems in an alternative way. Math takes on another dimension, leaving, for a while, traditional math problems aside. Pupils learn better when there is a proper mix of active and passive learning.



6

Geoboards are great for **active learning** because pupils get **hands-on learning experiences by creating figures related to the topic of discussion**. It prompts them to think creatively and apply their understanding to problem-solve. By doing lesson-related activities on a geoboard, pupils can immerse themselves in the topic and derive learnings from real-life experiences. Geoboards can particularly support learning measurement, space and geometry.



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While many subjects rely on lecture-based lessons, STEM can provide a break in that learning style. STEM activities and topics require many different skills, like problem-solving and critical thinking, that work better when pupils can interact with the subject material themselves. Some schools provide pupils with special STEM kits with different constructions to make. These vary depending on age, grade, cognitive level and learning objective.



CONCLUSION

Not everyone, pupils included, learn the same way, and math teachers must take into consideration several learning styles to reach most pupils. Gone are the days when the math teacher stands at the board representing class authority, giving a lecture and assigning loads of homework. The modern teacher acts as a facilitator in the learning process by always being ready to encourage pupils to experiment on the best learning style. **The modern-day math classroom is interactive and hands-on.** In addition to presenting mathematical concepts visually and orally, teachers must extend their teaching to another significant portion of the learning population: **the kinaesthetic learner** who must move around and touch objects to comprehend elusive concepts.



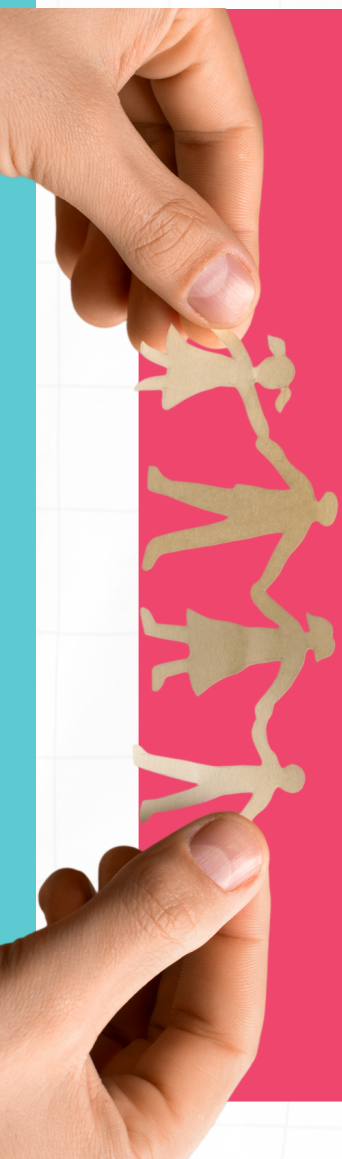
Using kinaesthetic learning resources with children at home



Math as a teaching subject often creates **fear and anxiety** in children known as “**math phobia**”. To some researchers, **math phobia** is transferred to pupils not so much through personal experience but mainly from parents or teachers. Parents with high math anxiety unintentionally convey the idea that **math is difficult and anxiety-provoking** while trying to help children with homework at home⁸.

The difficulty of **understanding and applying mathematical concepts together with the fear of failure make many pupils averse to mathematics**. This fact can often be transferred at home, in addition to the classroom, with parents finding themselves located in a closed corner, not knowing how they can help the children eliminate their anxiety.

It is well known that there is a triangular relationship (**teacher-pupil- parent**) for the success of education, so each actor in the triangle has its role to play in the elimination of math phobia from pupils. So, it is important for parents to know that there are techniques that can really help children change their minds about math in the long run. They can mainly be applied in the classroom by the teacher, but their application can be continued at home by parents themselves. By implementing these techniques (**kinaesthetic learning strategies**) at home, children feel that there is connection, continuity and consistency with the teaching method experienced in class, they maintain their interest in learning the subject and their self-confidence is further boosted.



⁸ Mahapatra, “Math Phobia.”



GUIDANCE FOR PARENTS ON IMPROVING THEIR CHILDREN'S MATH SKILLS WITH KINAESTHETIC LEARNING



When parents are involved in their child's education it is then easier to control and reduce math phobia in the long run.

Parents need to know what is being taught in their child's classroom. Some parents choose to come in regular contact with the teacher and discuss the learning difficulties their children face. Be open with your child's teacher and share what you have discovered that works or doesn't work for your child's learning. Ask the teacher what they have found that works for your child in the classroom and consider duplicating or combining learning strategies so there is consistency in the classroom and at home. **Some other good practices⁹ you can apply with your child are:**



Positive reinforcement



Positive reinforcement is a great way to help a child overcome math phobia. Focus on the skills that they have acquired and stay positive about the ones that still need some work.



Apply short physical activity breaks in between homework tasks



This could be something like finishing one math problem and then take a break like running around the yard or any physical activity of their choice before returning to finish the rest of the homework. Extended study without an opportunity for a break can cause frustration. Their attention and concentration will increase when regular breaks are built into their homework time. Something as simple as stretching, jumping rope, dancing, or bouncing on a trampoline can help your child have a productive break from homework, and launch them into some great learning time.



Incorporate visualisation techniques



Similar to visualisation techniques in school, ask them to break a problem statement into smaller parts and encourage them to imagine seeing themselves following the steps. Alternatively, use games like building blocks to help them visualise math problems or encourage dance, yoga and other physical forms of exercise and relaxation.

Despite the obstacles teachers, parents and children have to overcome to personalise learning it goes without saying that accommodating teaching to learning styles improves pupils' overall learning results, increases both motivation and efficiency, and enables a positive attitude to math teaching possibly resulting in overcoming math phobia.



Adapting kinaesthetic learning resources to children with special needs



Depending on the type of individualised support they require, read on to find out how two different profiles of special needs learners can make the most of kinaesthetic learning resources.



SUPPORTING CHILDREN WITH SPECIFIC LEARNING DISORDERS (SLD)

Pupils with Specific Learning Disorders (SLD) are **'experiential learners'** – meaning they are better engaged when learning actively, such as when moving around with their peers¹⁰. However, kinaesthetic learning may present difficulties for some pupils with SLD (such as those with dyslexia and dyspraxia) who struggle with:

- **coordination** (ie. identifying their left and right sides)
- **body and spatial awareness** (ie. difficulty mimicking movements and keeping balance)
- **fine/gross motor skills** (ie. challenges with grasping objects and moving 'fluidly').

In order to ensure that all pupils can participate actively in math lessons involving kinaesthetic activities, whether they include spinning, bending, tossing, balancing or any other movement, here are some adaptations you can implement for these pupils at home or at school:

Adequately prepare the room

Before conducting kinaesthetic learning activities, make note of how restrictive or open the learning environment is. It is recommended that you **clear the space of any distracting clutter**, so it's best to free pathways for pupils to move around the classroom without bumping into each other or classroom furniture/items. You can also eliminate distractions by **removing noises from the environment and checking that the room temperature isn't too hot or cold**.

The learning environment can be set up to include accommodations as well: give each child their own space for moving around by **marking the area around them**. By instructing the children to return to their area (if they venture out for certain activities), they will feel that they have more control over the space, making the area less intimidating.¹¹



¹⁰ Reid and Green, 100 Ideas for Supporting Pupils with Dyslexia, 80.

¹¹ Dixon and Addy, Making Inclusion Work for Children with Dyspraxia, 115.

Lead with direct instruction



Education researchers have touted the **'direct instruction strategy'** as particularly helpful for supporting pupils with SLD when they are faced with a new learning situation¹². This strategy encompasses:

- **Reviewing** previously learned material before the start of the activity
- Introducing the activity with a **lengthy explanation and demonstration** on how it can be done
- Checking that all pupils **understand a step before moving onto the next one**

Create simple and adaptable choreography



Avoid causing any mental strain with the movements you've planned for your class! Since children with SLD struggle with short-term auditory and visual memory (which includes difficulty remembering sequences), any movements you incorporate in your lessons should rely more on each child's **creative expression instead of insisting that the movements are perfectly replicated**. Being inclusive also means creating choreography that can be **'differentiated'**, i.e. if pupils struggle to mimic movements, present alternative ones.

Provide visual and verbal cues to help with memorisation of movements

As some pupils with SLD have trouble differentiating between their right and left sides, you can instruct them to hold up the index fingers and thumbs of both hands and ask: **"Which hand looks like the letter 'L'?"**, to remind them where their left side is located¹³. Another visual point of reference for determining the left side from the right can be a paper bracelet/watch placed on the pupils' left wrists before any movement activities.



In addition to visual points of reference, pupils can also be helped with memorisation with the use of verbal cues. This is because pupils with SLD perform better when they can articulate the process they are going through; thus leading to them **connecting the movement with the mathematical concept**¹⁴. If, for example, you're teaching children multiples by clapping your hands for every multiple of 3, allow them to whisper the numbers between the multiples of 3 (whispering "1, 2" before clapping and saying '3'). In this way, children do not have to rely on memorisation before they have mastered reciting their multiples. Another game which incorporates verbal cues during movements is 'Simon says', which can help children remember and sound out spatial concepts¹⁵.

¹² Ellis, *Balancing Approaches*, 29.

¹³ Singh, "Confusing Left And Right?"

¹⁴ Singh, "Confusing Left And Right?"

¹⁵ Singh, "Confusing Left And Right?"

5



Make activities collaborative

For your kinaesthetic learning activities, **avoid picking teams, competition and emphasis on being first**¹⁶. Instead, tailor instruction to groups of **5-10 pupils** and then create tasks with movements that they must work on together, while holding hands for instance. Pupils with SLD feel supported in this activity since they are less vulnerable to tripping when holding hands and when placed between pupils with greater dexterity¹⁷. A similar collaborative game which can curate a sense of togetherness and ease replication of movement is 'follow the leader'¹⁸.

6



Use props

Props can offer learning support to reinforce various types of movements. If, for example, your movements require being able to practice balancing, give your pupils a beanie bag that they can place on their heads while they do their movements and instruct them to make sure it doesn't fall off¹⁹. You can also use **music as a great way to ease the stress of movements or rote memorisation**²⁰. This can be done by singing the movements/concepts they are learning, creating songs together, or presenting pre-made songs for the activities.



SUPPORTING CHILDREN FROM DISADVANTAGED BACKGROUNDS



Special attention is also needed for socio-economically disadvantaged pupil profiles. These pupils from disadvantaged and immigrant backgrounds do not have the same family, economic and cultural background as most pupils. **These specificities lead to real difficulties in learning mathematics in particular.**

According to prior PISA assessments²¹, there is a relationship between economic status and pupils' performance in STEM subjects. In their home environment, **these children often lack access to intellectual stimuli** such as reading, cultural approaches (visiting a museum) or having an extracurricular activity (theatre or sports).

¹⁶ Victoria State Government, "Working with Students with Developmental Coordination Disorder."

¹⁷ Dixon and Addy, Making Inclusion Work for Children with Dyspraxia, 106.

¹⁸ Dixon and Addy, 103.

¹⁹ Dixon and Addy, 105.

²⁰ Reid and Green, 100 Ideas for Supporting Pupils with Dyslexia, 110.

²¹ OECD, "PISA 2015 Results in Focus."

Parents, for their part, may also feel powerless in the face of the school system or not legitimate in terms of their children's learning because they themselves sometimes have gaps in knowledge (languages, mathematics, etc.), even though they support their children's efforts to learn at school. This is likely to create situations of stress and irritation, particularly when it comes to doing homework. These life situations bring out different profiles of children: pupils who will be turbulent, others who will close in on themselves or who will tend to devalue themselves. It is important that parents can give honest feedback to the teacher on how their child is doing homework and not hesitate to ask for advice and help. Thanks to this approach, everyone will progress together.

To best adapt, the innovative approach of learning through **movement is a very relevant lever to foster motivation, attention and involvement of the learner**. In this way, a restless child who is asked to be quiet will really enjoy being allowed to move around, to move and express himself. On the other hand, a child who finds it difficult to open up to others will **gradually gain confidence and feel more at ease**. A pupil can become accustomed to **expressing himself or herself through movement** and, thus, **create social links** with his or her classmates.

An activity such as a game of hopscotch for learning numbers, for example, is inexpensive and can easily break down the language barrier for a child from an immigrant background and create a **better integration into the group**. The child will feel valued and motivated to do this type of activity again. Just like game activities to count with your hands (additions, subtractions, multiplications...), will adapt to all levels and cost nothing financially.



Kinaesthesia can be a means of appropriating knowledge by involving the pupils physically and therefore actively in the proposed learning, with no added expenses. In addition, the free availability of all these resources also allows the inclusion of these pupils because they can easily use them at home independently or with their families.



Teaching and learning math with storytelling learning resources



The Math&Move project, intended for pupils aged 6 to 9 years, is part of the Erasmus+ project whose goal is to use kinesthetic techniques for a better understanding of abstract mathematical concepts. By learning through play and body movements, children activate their imagination when acquiring mathematical knowledge and turn to more creative problem solving.

In order to achieve excellent results, it is necessary to connect abstract mathematical concepts with the concrete reality of pupils aged 6-9 using movement and storytelling. Pupils are provided with tangible activities (either through whole body or body movements) that put traditional math instruction in a specific context, using examples that activate their imagination and thus reduce the stress associated with learning math.

In this way, the multidisciplinary approach of this project will also simultaneously reach a diverse set of pupils by dealing with different intelligences: visual-spatial, verbal-linguistic, logical-mathematical and bodily-kinaesthetic.

Using storytelling learning resources with pupils in class



Mathematics is often thought of as a set of facts and skills that must be learned. Often these facts and skills are something that is not natural and easy for the pupil. When this happens, the pupil looks for a solution to memorise rules and norms, which makes mathematics boring and does not result in a good mastery of mathematical material.²²

What are the advantages of using stories in teaching mathematics? **Stories can contribute to better memory, motivation, pupil involvement and improve analytical skills.** They can **introduce or explain difficult concepts and engage children in the lesson.** We should not forget that everything in mathematics has its purpose in people's lives; which is to say that mathematics has a human meaning. **Stories can refresh the teaching process, curate a creative atmosphere, but also bring fun.** Since storytelling is an interactive activity, stories can be used as an excellent way to **engage pupils in mathematical activities** that, in traditional forms of teaching, are managed by teachers.²³

In class, the teacher can use non-verbal cues to motivate pupils, especially when he is in **the role of narrator.** "Non-verbal communication plays a special role in pupil motivation. Namely, the teacher's characteristics that have the greatest influence on motivation (warmth, empathy, enthusiasm) are mostly transmitted through **non-verbal channels.**"²⁴

In addition to the fact that the storyteller should love the story himself, Velički lists guidelines that can help before telling the story:



Think about how to adapt the story to a small audience.



Provide enough time to talk. We must also have time for possible children's questions, conversation, clarifications and continuation of the story.



Choose the right time to talk to create a good listening atmosphere. This is especially true after being active, as often after physical activities, the child is more prepared and willing to listen.



Despite children's requests to tell another story, it is recommended to tell only one story and think about the possibilities of deepening it. This is the only way we can avoid talking without a plan and raising a child for superficiality.

²³ Zakis and Liljedahl, 4.

²⁴ Miljević - Riđički, Učitelji za učitelje, 53.



Pay attention to the spoken interpretation of the story. Through conversation, we enrich the child's vocabulary and gently pave the way from dialect and "native" speech to the standard language.



We should not learn the text of the story by heart, but try to gain inner insight into the story and experience it as a whole. Only then will we be able to pass it on to the children." ²⁵



HOW TO PREPARE YOUR PUPILS FOR STORYTELLING LEARNING STRATEGIES


Stories are much more than entertainment. They encourage mental representations, build bridges and send messages, making the actual message much more powerful. That's why storytelling should be an integral part of every lesson. **Storytelling is not limited to subjects such as history, literature, etc., but can be equally used to show mathematical procedures.**

When we encourage pupils to co-create a story, whether it's made up to teach a lesson or a real-life example, we need to make sure that **every part is important and meaningful**. Pupils should be familiar with the elements important to a storytelling strategy. It is important to stick to the main topic. If we are not sure whether something is important or not, it would be good to exchange opinions with other colleagues.

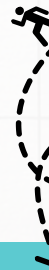


In order to follow the sequence of events, it is necessary to **create a chronology of events** in your story. A blank timeline can be drawn onto which important events will be added as they occur, so that when filled in, it will be a great visual reminder for pupils. If the story teaches about abstract concepts, it is best to find a **real-life example that will be as close as possible to the pupils' lived experiences**. Mathematical formulas seem much more meaningful when they are presented through real-life situations. The main characters of the story do not have to be people, but they have to be carriers of human traits and feelings. They don't have to be perfect. The story should be accompanied by **tension and mystery**. Because if they manage to solve the mystery, it will **remain in their long-term memory**.





Before they start and tell the story, they need to come up with an ending. On a timeline, it's best to write the end first, then what comes immediately before that... and so on to the beginning. The point should always be at the end of the story. No matter how complex or difficult the situation is, it is preferable to tell the truth.



Telling stories is an ideal opportunity to master new concepts and words. Almost every story can benefit from props, so it is preferable to gradually introduce them into the story, and that in the most impressive and key parts of the story. In order for all pupils to get involved and be as active as possible, it is necessary to encourage discussion by asking questions. When pupils are able to offer their predictions they will be more interested in listening to the end and checking if they were right. Pupils can also study in groups.

After the storytelling ends, groups are formed, and each group tells the story again, but in a different way, with a **changed ending**. This is how pupils learn from each other how stories can have different interpretations or solutions.



PARTNERSHIP GOOD PRACTICES IN APPLYING STORYTELLING LEARNING STRATEGIES IN CLASS

It has been shown that, by sharing experiences with colleagues, telling stories in class is a very effective tool that not only further encourages pupils' activity in the classroom, but this activity can be continued outside of school, that is, the story remains in their memory even after they leave the school bench.



Children listen to stories from an early age, whether they are told by adults or get to know them in another way through the media (radio, television, the internet). Stories are an integral part of most children's lives and they are an excellent means of imparting knowledge. There is an instructive lesson in stories, therefore, they are in themselves a medium through which children learn. **By connecting teaching content and telling stories, pupils can connect previously learned content with new content.** In this way, the story becomes an interesting form of learning. The development of imagination and creativity is certainly a "consequence" of telling stories. And still, telling stories in the classroom is a process that should be an activity, not the backbone of the lesson.



As can be seen in the exchange of ideas with school colleagues, **the focus of teaching should remain on the lesson while telling stories can be a means by which to build on it.** There is no doubt that the teaching of mathematics should be humanised and removed from the traditional form of instruction to be more interesting, creative and imaginative, but in this process it is necessary to keep in mind that the goal of teaching mathematics lies in presenting a problem and solving it with mathematical concepts.



Using storytelling learning resources with children at home

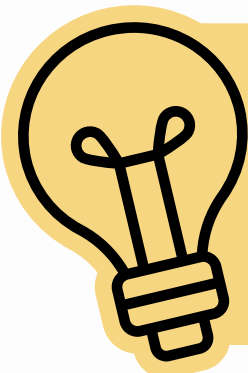


The family environment can provide numerous opportunities for early learning, so the involvement of parents in educational activities with children is extremely important for the development of their competences and their later achievement. Research has shown that children of parents that spend more time learning with them and developing healthy reading habits exhibit better academic achievement²⁶.

Parents who devote time to educational activities with their children before their child starts school, **shape the interests and values that are important for later educational achievements and successful assimilation into school**.²⁷

Special attention is paid to looking at the family environment for learning and the activities of parents with children at an early age that are aimed at literacy development. The aim of the language activities is the development of literacy and raising the child's language competences. The basis of these activities is **encouraging the child to read e-books and other written materials with the help of parents**, talking about what has been read, telling stories, writing letters and numbers, singing songs, and participating in various games that use letters and words.

It is necessary to point out to parents the importance of developing reading habits in children and to introduce them to the ways in which they, as parents, can contribute when it comes to accustoming the child to this activity. It would be useful for parents to familiarise themselves with **different ways in which they can participate in reading activities with their children**, such as dialogic reading techniques that achieve not only vocabulary development, but also the implicit development of phonological awareness, grapheme acquisition and a higher level of reading comprehension in the child.²⁸



It is important to emphasise that the point of joint reading between children and parents or some other close person is a positive emotional experience for the child. In this way, the child perceives reading as a pleasant activity that he wants to repeat, which is extremely important when it comes to his or her motivation to read at a later age and the development of reading habits.

²⁶ Castro et al., "Parental Involvement on Student Academic Achievement."

²⁷ Duncan et al., "School Readiness and Later Achievement."; Hart and Risley, "The Early Catastrophe. The 30-Million-Word Gap."

²⁸ Teodorovic, Vujacic, and Djerić, "Uticaj Individualnih Karakteristika Učenika Na Postignuće i Interesovanje Za Matematiku i Biologiju"; Wesseling, Christmann, and Lachmann, "Shared Book Reading Promotes Not Only Language Development, But Also Grapheme Awareness in German Kindergarten Children."



GUIDANCE FOR PARENTS ON IMPROVING THEIR CHILDREN'S MATH SKILLS WITH STORYTELLING LEARNING RESOURCES

A parent is their child's first and most important teacher. The parent can help the child acquire new information, skills and ways of behaving. **Modeling is usually the most effective way parents can use to help a child learn a new skill.** With the help of parents, children's attention and activities can be directed in a way that allows them to understand and grow in their ability to communicate through mathematics. Mathematical activities are aimed at introducing children to basic mathematical concepts and increasing their mathematical competence by practicing various games with numbers, shapes, building blocks, cards and boards, writing numbers and different shapes, and measuring and weighing different objects. The parent must be daily involved in the work and support the child.



Adapting storytelling learning resources to children with special needs



Our storytelling learning resources can also accommodate pupils that have diverse learning needs, such as those with Specific Learning Disorders and those with disadvantaged backgrounds. By focusing on how to make them more accessible to these target groups, we've prioritised a smoother acquisition of math skills via storytelling.



SUPPORTING CHILDREN WITH SPECIFIC LEARNING DISORDERS (SLD)

Although pupils with SLD can respond better to the use of e-books compared to printed books for decoding text²⁹, they may still struggle with resources that rely on reading skills as these learners face **difficulties with visual recognition, phonological awareness and spelling**³⁰. Nevertheless, there are several practices you can adopt with the use of storytelling resources to alleviate the difficulties associated with visually processing and reading text:



Take advantage of the built-in accessibility features of e-books

The utility of e-books is seen in their **adaptability and personalisation**. Unlike physical books, e-books do not have to be confined to their original text and content layouts. Instead, they can be read using an e-book reader, a multi-functional device like an iPad, or by using software on a computer or mobile device³¹. If you are aware that your class consists of pupils with reading difficulties, you can use these digital aids to **change the e-book's text size, highlight passages and input text-to-voice software** so that children can hear the entire story or singular vocabulary correctly pronounced and read to them.



Provide structure to the activity

Children that struggle with reading may be overwhelmed with the prospect of reading unfamiliar text. You can provide some routine and predictability to this activity by, first, **previewing the story's premise and preparing questions** to make it more relatable to pupils³². Better organisation of the activity also entails **writing key vocabulary** for pupils to understand what they should focus on while reading. Where needed, provide **visual backup** of key words in the form of pictures, gestures or actions³³.

You can also add structure to the task of reading comprehension. Usually, pupils with SLD are able to focus more on comprehension when they hear another pupil reading, which is why it is a good idea to **encourage reading in pairs or in small groups**. The issue of SLD learners being anxious about reading aloud in front of others is diminished when you've begun the activity with a preview of the text (as suggested above) or have them read after listening to another pupil³⁴.

²⁹ Schneps et al., "E-Readers Are More Effective than Paper for Some with Dyslexia."

³⁰ "How Can E-Books Help Children with 'DYS' Disorders?"

³¹ "Accessibility and Ebooks."

³² Dixon and Addy, Making Inclusion Work for Children with Dyspraxia, 148.

³³ Dixon and Addy, 150.

³⁴ Farrell, Supporting Disorders of Learning and Co-Ordination, 21.



Incorporate breaks in reading

Due to the higher level of concentration needed to overcome the obstacles they face when reading, pupils with SLD **exert more effort and tire more easily** during this activity, especially because the storytelling resources target the development of not only reading but arithmetic skills, too. Therefore, **break the activity up into chunks** as this can improve reading retention and reduce the visual strain that pupils with SLD experience.³⁵



Remember that reading should be for enjoyment

To combat the performance anxiety that is especially prevalent in pupils with SLD, present the activity to all children as, first and foremost, a storytelling activity, and not a math equation to be solved. This means **introducing the story in a way that intrigues them** and, then, reading it aloud to them once **just for enjoyment**.³⁶ This will ease them into the story elements (characters, setting, and dilemma), so that they feel more comfortable approaching it with a mathematical lens and noticing mathematical concepts upon reading it the second time. No matter how many times the story is read, **cultivate fun in the classroom** by encouraging the children to role-play as different characters and use silly voices when reading.

For parents/teachers that would like to make their own e-book stories for teaching math concepts, here are some design and content considerations to abide by for optimal accessibility for pupils with reading disorders:

- **For accessibility of text layout:**
 - **Fonts should be in the Sans Serif font family (Open Sans, Verdana, Arial, Calibri, etc.)**
 - **Font size should be 12pt (for body text) and 14-16 pt for (sub)headings**
 - **Line spacing should be 1.5**
 - **Text should be aligned to the left**
- **Emphasise text with bold and list items with bulletpoints**
- **Opt for shorter sentences and use literal language instead of metaphors and slang**
- **Avoid using pages that are too highly contrasted such as black text on a white background; instead, choose a dark grey colour for text or a cream colour for the background**
- **Enrich with multimedia: add images and audio to give context to the text!**

³⁵ Dixon and Addy, Making Inclusion Work for Children with Dyspraxia, 148.

³⁶ Holton, "5 Ways to Use Ebooks to Drive Learning in Classrooms."



SUPPORTING CHILDREN FROM DISADVANTAGED BACKGROUNDS

It is also necessary to see to what extent storytelling can be an interesting lever in the learning of STEM and more particularly mathematics for **children from a more difficult socio-economic background**. The original environment in which the child evolves is recognised as exerting an influence on his cognitive and linguistic abilities in school learning. **Children from disadvantaged backgrounds will tend to have greater difficulties in acquiring knowledge** from the start of school.



A child from a disadvantaged background has often been **less familiar with** the activities of **reading, verbalization or listening to stories in his or her family environment**, so it is natural that he or she has a harder time appropriating storytelling skills, which are important in all disciplines. The consequence is that these children have not acquired the necessary tools to autonomously use this technique in the application of learning³⁷. While children from privileged backgrounds will have acquired language skills allowing them to be comfortable communicate on different subjects, other children will have more difficulty expressing themselves orally.

Whether **through writing, listening, or telling, storytelling helps all children perceive and understand things more effectively**. It is a stimulating method for the brain which allows an improvement of comprehension and reflection. It also improves critical thinking and thus allows pupils to synthesise information and then restore it. It is thanks to this path that knowledge will be incremented in the brain of the learner.

Promoting the use of storytelling resources to learn can allow easier and more effective assimilation of pupils' knowledge, especially for those from a disadvantaged background.

Indeed, the fact of being able to personalise the e-books will allow a better adaptation for these pupils and gradually, it will also make it possible to enrich their vocabulary in a simple and playful way. Free access to these tools is an additional asset both for familiarisation with digital technology and independent learning at home.

It would therefore be appropriate to integrate storytelling more systematically into the learning of younger children, in particular for STEM learning.



Combining movement with e-books: a multidisciplinary approach to improving math skills



THE IMPORTANCE OF COMBINING INNOVATIVE LEARNING APPROACHES TO INSPIRE PUPILS TO LEARN MATH

Familiarising children from an early age with STEM subjects and especially with mathematics appears to be an important element to later academic achievement. Studies show that the performance of pupils in the European Union suffers from a low level of achievement in mathematics and science subjects³⁸. This can be explained by the fact that, these subjects seem to be inaccessible and abstract for most learners, but also because they can be complicated to transmit.

Giving motivation and interest to pupils in acquiring knowledge in these areas depends largely on the methods used, but also on the tools used to make learning as accessible as possible. For several years now, many research studies have shown the real benefits of using innovative approaches to knowledge acquisition from a very early age³⁹.

These methods are mainly **based on the active participation of learners**, which allows a better appropriation of knowledge: pupils take on an active role in their learning.



Because of the often-playful aspect of these methods, they enthuse pupils, who then take pleasure in discovering new concepts. They encourage reflection, communication, the freedom to make mistakes and gain self-confidence.

³⁸ OECD, PISA 2018 Results (Volume I).

³⁹ Newcombe, "Harnessing Spatial Thinking to Support Stem Learning."

But there is no one method that is more effective than another, it is the **combination of these methods that increases the positive effects tenfold**. For example, it is more beneficial to **combine observation and practice** with a scientific concept to make it more real, rather than learning it by heart. Similarly, pupils will develop more confidence, even if they are wrong, when they feel **valued and guided**, rather than simply being told that their answer is wrong. This practice of **active pedagogy, allows the development of learning in different forms** such as: workshops, group activities, game, dance... but also thanks to multiple tools: objects, interactive books, or digital media...

It is in this sense that the **Math&Move** project is relevant, as it **combines several methods and tools for a more playful approach in order to improve pupils' knowledge of mathematics**.



WHAT IS THE CONTRIBUTION OF THE MATH&MOVE PROJECT FOR PRIMARY EDUCATION

Childhood is a pivotal phase in terms of knowledge acquisition, as it shapes the adult of tomorrow to a large extent. It is therefore **essential to enable children to acquire all the skills that will be useful to them throughout their lives, starting in early childhood**. In this project, the focus is on the **combined approach of innovative learning methods** for primary school pupils aged 6 to 9.

We have previously seen the benefits that these methods can bring and in **the context of a society that increasingly uses digital tools**, Math&Move proposes to combine e-books and movement for an immersive and engaging way of learning mathematics **by taking into consideration all types of learners**.

This approach to **movement and narration through digital tools** aims to involve the child as much as possible in a playful way by appealing to the stimulation of the senses: looking, touching, listening and of course moving, i.e. using one's body to **appropriate knowledge more easily and retain it for longer**.

This teaching method has a real impact on children in general, and learners with special needs in particular (such as those with **Specific Learning Disorders** or those coming from **a difficult socio-economic background**). Indeed, unlike conducting a long-winded lecture on mathematical concepts which seems insurmountable for some pupils to master, this way of approaching the same concepts allows pupil to evolve in a benevolent, playful and less stressful environment⁴⁰.



This will result in:



- **Reinforced motor skills and self-confidence through movement and play**



- **Improved listening, concentration and comprehension skills**



- **The acquisition and improvement of linguistic and mathematical knowledge**



- **The development of curiosity to discover new knowledge**



- **Greater familiarity with digital technology**



- **Increased motivation and desire to learn**

The **contribution of the Math&Move project is diverse**: it brings a new perspective and dynamic to the learning of mathematics, thanks to the **combination of active pedagogies such as movement and narration with digital support, and thus, instilling in children a love of learning**. On the other hand, it **provides teachers, educational teams and parents with relevant and easy-to-use tools so that they themselves can be more comfortable in transmitting this knowledge to young learners**.



PROMOTING AND IMPROVING DIFFERENT INTELLIGENCES WITH THE MATH&MOVE METHOD

The notion of intelligence, which is often scarcely defined due to a lack of information on the subject, should also be clarified. There is no doubt that **all children are intelligent in diverse ways, no matter their circumstances or individual difficulties**. Everyone has special talents for learning, understanding and overcoming barriers, but **often the difficulty is to be able to propose a method that will suit all individual talents**.

According to Howard Earl Gardner, an American psychologist, there are **multiple intelligences**⁴¹ often under-exploited in learning in general. Let's dive into more detail on **what they are, in order to highlight the links and the benefits brought by this project.**



Logical-mathematical intelligence



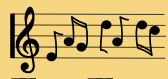
This kind of intelligence is based on an ability to **make calculations**, to be organised and to be analytical. These are often children who have a liking for **thinking games or puzzles** for example and which ask a lot of questions.



Verbo-linguistic intelligence



This form of intelligence involves the ability to **understand and use words, including an aptitude for dialogue, listening or storytelling**. The children concerned will enjoy **playing with words**, like making rhymes for example.



Musical-rhythmic intelligence



Often associated with creativity, the child who possesses this form of intelligence often shows a **sensitivity to sounds and melodies**. They are used to humming tunes, creating ditties and accurately timing beats. For these children, music can be a source of inspiration for learning.



Body-kinaesthetic intelligence



This form of intelligence, which is predominant in athletic people, is based on **the ability to use one's body in a precise and coordinated way through movement**. It is also found in activities that require manual skills. Children with these abilities often like to move and **use their body to express themselves** or manipulate objects.



Visual-spatial intelligence



This is characterised by a strong capacity for mental representation of places or ideas and a good sense of orientation. For example, it can be seen in pupils that prefer to explain their thinking by drawing. These children need to **visualise concepts mentally or through symbols (pictures, drawings...)**



Interpersonal intelligence



Similar to empathy, this form of intelligence allows a good understanding of others and an **ability to act towards them** in an appropriate way. The pupil tends to want to help others and shows tolerance and discernment. These pupils will enjoy **learning in groups** or participating in role-play.



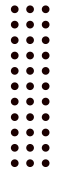
Intrapersonal intelligence



These individuals are aware of their strengths and weaknesses and are realistic in their decision-making and actions. This type of pupil likes to **learn at his or her own pace and is persistent in accomplishing a task.**



Naturalistic intelligence



This form of intelligence is noticeable in people who are sensitive to the situations of living things. They are interested in fauna and flora and are highly observant. The pupil concerned is sensitive to nature and **likes to recognise, classify and organise.** He or she enjoys learning in a pleasant working environment, for example in a classroom with plants or near a window.



Thanks to its innovative approach, which aims to target an aspect of all of these intelligences, the Math&Move project helps to promote and develop them in order to improve pupils' learning and mathematics skills.



THE POTENTIAL OF APPLYING THIS MULTIDISCIPLINARY TECHNIQUE BEYOND MATH SKILLS ACQUISITION



Speaking and storytelling skills are the main factor through which pupils acquire knowledge. Through telling a story to a child of the youngest age, not only is speech encouraged, but the child's sense of observation, memory, thinking, and reasoning also increases. Children have an innate love for stories. Stories create magic and a sense of wonder, provide children with an entry into unknown and mysterious landscapes. Through stories, children will easily learn new sayings, enrich their vocabulary and expand their knowledge.

When we talk about **learning foreign languages** from a young age, i.e. in pre-school age, we should keep in mind that these classes are significantly different from classes for the elderly. First of all, children of a younger age acquire language content in different ways, and that is why the teaching of a foreign language should be fully adapted. This requires a very professional professor with a lot of work experience. Children's imagination is most intense at that age and children observe the world through play. Let's remember that children develop their first motor skills by touching different toys, then they acquire their mother tongue by parents, grandparents constantly humming and repeating rhythmic numbers and songs.



At this age, a foreign language is learned in the same way as the mother tongue. It is necessary to activate and play with all the children's senses so that through associations of colours, sounds, smells and touches, words are spontaneously connected to some object.

Children have a lot of energy and love to move. **We cannot expect pupils to sit quietly at the table and listen for the whole class.** It is necessary to adapt the space in such a way that children can move freely through the classroom. Movement is extremely important in learning a foreign language, because in addition to relaxing children, it also facilitates the learning of correct pronunciation and accents through specific body and respiratory movements.

Stories are much more than entertainment. They encourage mental representations, build bridges and send messages, making the actual message that much more powerful. That's why storytelling should be an integral part of every lesson. A teacher who is a great storyteller can ensure that any content he teaches is remembered years later.

Storytelling has an important role in literature, history, etc. classes, but it can equally be used to show scientific or mathematical problems.

In the end, **stories bring information, knowledge and life truths.** Movement is the primal need of people to express what they feel. **Storytelling and movement form an important point of connection between people and provide meaning, context and understanding in the world we live in,** especially when it is illogical, incomprehensible and lacking order.



Conclusion

The development of this pedagogical guide is intended as a methodological basis for explaining how to implement innovative pedagogies involving movement and stories not only in the classroom, but also in non-formal environments.

This project is **based on an observation** made many years ago by the results published by the Program for International Student Assessment (PISA)⁴². The latest assessment, dated 2018, shows very poor results in the knowledge of European primary school pupils in science, technology, engineering and mathematics (STEM) subjects. At the same time, according to researcher Thomas Frey, Director of the Da Vinci Institute, "by 2030, 2 billion jobs will disappear worldwide"⁴³.

Therefore, in an ever-changing world in which digital technology plays a major role, **it is essential that teaching methods evolve in order to provide all the necessary tools for future adults**. It will also enable places of employment to rely on a strong workforce with solid skills in these areas to meet the challenges of tomorrow.

It is in this sense, that this **Math&Move project wished to address STEM learning in general and mathematics in particular, by giving a multidisciplinary approach, in order to increase the performance of pupils from primary school. This approach, which mixes several methods and targets a range of intelligences**, will facilitate a better appropriation of mathematical knowledge and concepts, and encourage the commitment and motivation of these young pupils for this subject. Bringing dynamism to learning, through **lessons with movement, introduced by short stories**, combined with a fun digital medium such as e-books, **brings together many advantages and benefits necessary for a solid and lasting acquisition of mathematical knowledge**.



⁴² OECD, PISA 2018 Results (Volume I).

⁴³ "L'ère Du Numérique: Des Milliards d'emplois En Voie de Disparition."

As mentioned in this guide, the aim is to get pupils to be actors in their own learning so that they can appropriate the essential knowledge by approaching learning in a playful way, using multi-sensory elements – movement, storytelling, manipulation, cooperation and exchange. Also, we aspire to motivate them to be at ease in the use of what we call new technologies and which for them, as they mature, will eventually be facilitators, tools for their future lives – in their private and professional environments, but also in their social interactions. This learning process will also allow the development of other non-formal skills such as curiosity, critical thinking, listening...

It is clear that inclusion is an important part of this project, as it is essential to adapt learning methods to all learner profiles so that no one is left behind. Therefore, we have put the focus on the recognition of each child's individuality and the rethinking of the process of transmitting knowledge so that all children feel involved.

Pupils with special needs who often have learning difficulties such as DYS-disorders (dyscalculia, dyslexia, dyspraxia and dysgraphia) or those with disadvantaged backgrounds (such as those in poor socio-economic situations and/or those with immigrant backgrounds) are indeed an important target of the project's results. Thanks to this method, the use of the results obtained can be put to good use by all learners (of all profiles), as a source of mutual enrichment through the development of values such as benevolence, valorisation, mutual aid and collaboration.

For teachers, educational teams and parents of pupils, we wanted this guide to put forward concrete keys and ideas that can be easily used and adapted so that they, too, can appropriate and transmit mathematical concepts.

Through our active collaboration, our knowledge and experience has led us to promote the method and learning activities of Math&Move **as simple, replicable, adaptable and scalable tools that will result in an increase in pupils' math performance and proficiency.** Our ultimate aim has been to demonstrate that the method and tools used to transmit (often abstract) knowledge must be innovative and attractive, in order to motivate young learners to engage with these subjects.





For several years now, traditional educational environments have undergone changes brought on by the impact and contribution of digital technologies and new methodologies. It is now time for educational systems everywhere to further open up the field of possibilities for innovation by fully integrating these new methods into the learning processes of the 21st century, in the interest of their young learners and their own pedagogies.

Thanks to the adaptability and free access of our resources, Math&Move wishes to contribute to the process of making learning mathematics more appealing, more worry-free, and more efficient for both learners and their mentors – so as to, hopefully, positively influence the way in which pupils approach and think about mathematics.

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