

Module code: ECIE5002

Module: Numbers Count

Name: Sarah Stanley

Submission date: 01/03/2026

Lecturer: Heike Griffiths

## **Contents page.**

|                                                                      |         |
|----------------------------------------------------------------------|---------|
| Element one - Essay - Why is good numeracy important?.....           | page 3  |
| Element two - Blog - What can schools do to encourage numeracy?..... | page10  |
| Element three - Resource – Information Sheet.....                    | page 20 |
| Element four - Video of the resource.....                            | page 23 |
| Element five - Evaluation.....                                       | page 24 |

## **Numbers Count (ECIE5002)**

### **Element one**

#### **Why is good numeracy important? 1000 words**

This essay will discuss the importance of mathematics today and examine how it is used in everyday life, education, and modern industries. It will also explore how mathematics helps develop problem-solving and critical thinking skills.

Good numeracy skills are very important in today's society (Harris, 2023). They help individuals stay healthy, support the economy, and allow people to participate in democracy (Schleicher, 2014). Being good with numbers is more than just doing math; it's a vital skill that helps people understand and handle the complex, data-filled world around them. This essay explains why good numeracy is important for personal growth, society, and making informed decisions as citizens (Officer, 2019).

Numeracy means being able to understand and use numbers in everyday life (OECD, 2025). It includes basic maths skills, as well as understanding statistics, probabilities, and solving real-world problems using maths (Raising Children Network, 2023). In today's world of fast technology and lots of data, good numeracy is more important than ever. It helps people become more confident, take part in the economy, and participate in democracy (Bredberg, 2020). For instance, imagine someone shopping for a new phone plan. They need to compare different plans based on monthly costs, data allowances, and additional charges. Without good numeracy skills, they might struggle to understand percentages, such as discounts or data fees, or to calculate which plan offers the best value over time.

Having good number skills helps people understand money, stay healthy, and find jobs (Schleicher, 2014). According to the OECD, being good with numbers makes it easier to handle personal finances, understand medical advice, and make smart lifestyle choices (View, 2018). For example, understanding interest rates, inflation, and investments needs basic math skills, which are important for financial security later in life (Skagerlund et al., 2018). Also, good number skills help people understand health information, so they can take better care of themselves (Public Health England, 2015). For instance, consider someone planning their retirement savings. To do this effectively, they need to understand how interest rates and inflation will affect their investments over time. Without basic math skills, they might not understand how compound interest grows their money or how inflation reduces what their money can buy. This can cause them to underestimate how much they need to save.

In society good number skills help people become active and informed citizens (House of Lords, 2021). In democracies, citizens need to understand political numbers, evaluate economic policies, and take part in social debates. Being able to analyse numerical information helps people check government reports, understand census data, and judge scientific studies. This ability helps create a well-informed public, which is important for a healthy democracy (Quaranta, 2017).

Good numeracy skills are important for a strong economy and a productive workforce (Brown, 2024). In today's digital world, many jobs need the ability to work with numbers, analyse data, and understand complex information (Perry, 2025). On the other hand, lacking numeracy skills can make it harder for people to find jobs, keep them out of poverty, and slow down economic progress (GOV.UK, n.d.). For example, in the banking and finance sectors, employees are often required to analyse large databases, calculate interest rates, and assess risks with investments. A person with strong numeracy skills might excel in roles such as financial analyst, accountant, or data scientist, contributing directly to economic growth. Conversely, someone lacking these skills may struggle with basic banking tasks, like understanding loan terms or managing budgets, which can limit their employment opportunities and hinder personal financial stability. On a broader scale, during economic crises, countries with a higher proportion of numerate citizens are better equipped to understand economic indicators, interpret government policies, and respond effectively (E. Ezzahid et al., 2022). For instance, understanding how inflation impacts prices or how unemployment rates influence government decisions allows citizens to participate more actively in debates about economic policy, thereby supporting more resilient and sustainable economic development. Numeracy also affects how people make financial decisions and how markets work. People who understand numbers well are more likely to make smart money choices, avoid debt, and invest wisely ([www.nationalnumeracy.org.uk](http://www.nationalnumeracy.org.uk), n.d.). A society with many numerate people can better handle economic problems, create good policies, and support sustainable growth. So, governments and leaders should promote numeracy to strengthen the economy and social stability. (Numeracy skills interventions for adults (19+): A systematic review of the evidence, 2023).

Constructivism is not a single, uniform approach; instead, it includes several different types that influence how students learn and develop. Cognitive constructivism, based on Jean Piaget's work, focuses on how learners actively build knowledge through their own interactions with the world. It emphasises the importance of exploration and discovery as key parts of learning. Social constructivism, inspired by Lev Vygotsky, highlights the role of social interactions, language, and culture in shaping understanding, suggesting that knowledge is created through collaboration with others. Radical constructivism, proposed by Ernst von Glasersfeld, takes a more individualistic view, arguing that all knowledge is personally constructed and that there is no objective reality outside of one's own experience. By understanding these different forms of constructivism, cognitive, social, and radical, educators can better

support diverse learners and develop more inclusive and effective learning environments (Ravi, 2024).

The political world is affected by how well people understand numbers, and it also influences numeracy (Baker et al., 2020). Leaders use data to create and judge policies. When people are good with numbers, they want more transparency and can better spot false information (Stepney and Lally, 2024). But if people struggle with numbers, they are easier to mislead, which can harm democracy (Roberts, 2024).

Social inequality is made worse by differences in math skills. Kids from poorer families or who don't have good access to education often struggle with math. This can limit their chances of getting good jobs and having a better life, making social gaps bigger. To help with this, Welsh education policies like the Curriculum for Wales focus on making learning fair for everyone. Support programs like the Pupil Development Grant also help disadvantaged students. Using tools like the Equity and Digital Inclusion Framework, which makes sure students have access to computers and the internet, learns digital and math skills, and checks progress, can make these efforts stronger (Garcia and Weiss, 2015). The digital gap also makes it harder for some students to learn. Those without access to technology or the internet find it difficult to learn important skills like math. The Welsh Government's Digital Learning Framework aims to fix this by giving more students access to digital tools and teaching digital skills as part of their lessons. As digital skills become more important for finding information and opportunities, this gap can make social inequality worse. By following the principles of the digital inclusion framework, making sure all students have access, helping them develop skills, and checking how well they do, Welsh schools can help ensure every student can take part fully in society (van de Werfhorst, Kessenich and Geven, 2022).

Educational systems are very important for teaching good math skills. Pedagogy, or the way teachers approach teaching math, such as using constructive methods like hands-on activities, visual aids, and real-world problem solving, helps students build understanding and apply concepts effectively (Kaya and Keşan, 2023). For example, students might use blocks or drawings to understand fractions or solve practical problems like budgeting. Collaborative pedagogy, which encourages students to work together on projects, share ideas, and learn from each other, can also enhance learning. Examples include group problem-solving tasks, jigsaws, peer teaching, or math clubs where students collaborate to tackle challenging problems. These approaches not only improve understanding but also boost motivation and confidence. Policymakers should invest in quality math teaching, effective teacher training, and inclusive practices so everyone can develop strong numeracy skills. It's also helpful to promote a positive attitude towards math and show how it relates to daily life, which can motivate students (Chen et al., 2018). Learning math throughout life is important too, so adults can improve their skills and keep up with changing society (Schleicher, 2014).

In conclusion, good math skills are very important today because they affect our well-being, the economy, and how we participate in democracy (Roberts, 2024). Being good with numbers helps people make better decisions, understand data, and contribute to society (Kaya and Keşan, 2023). To create an inclusive and strong community, it's important to improve math education and support for everyone. As technology advances and data becomes a bigger part of daily life, having strong numeracy skills is more important than ever. It helps individuals succeed and keeps society fair and stable.

## **Reference list**

Baker, S.G., Patel, N., Gunten, C.V., Valentine, K.D. and Scherer, L.D. (2020). Interpreting politically-charged numerical information: The influence of numeracy and problem difficulty on response accuracy. *Judgment and Decision Making*, [online] 15(2), pp.203–213. doi:<https://doi.org/10.1017/S193029750000735X>.

Bredberg, J. (2020). The role of mathematics and thinking for democracy in the digital society. *Policy Futures in Education*, 18(4), pp.517–530. doi:<https://doi.org/10.1177/1478210319899242>.

Brown, A. (2024). Cost of Living for international students studying in the UK; findings from the International Student Barometer. *Etioglobal.org*. [online] doi:<https://doi.org/100428982761/1734523607693>.

Chen, L., Bae, S.R., Battista, C., Qin, S., Chen, T., Evans, T.M. and Menon, V. (2018). Positive Attitude Toward Math Supports Early Academic Success: Behavioral Evidence and Neurocognitive Mechanisms. *Psychological Science*, 29(3), pp.390–402. doi:<https://doi.org/10.1177/0956797617735528>.

E. Ezzahid, Z. Firano, J. Ennouhi, A. Laaroussi and A. Serghini Anbari (2022). Countries' readiness to deal with large-scale crises: analysis, measure, and World classification. *Policy Sciences*. doi:<https://doi.org/10.1007/s11077-022-09464-4>.

Garcia, E. and Weiss, E. (2015). *Early Education Gaps by Social Class and Race Start U.S. Children Out on Unequal Footing: A Summary of the Major Findings in Inequalities at the Starting Gate*. [online] Economic Policy Institute. Available at: <https://www.epi.org/publication/early-education-gaps-by-social-class-and-race-start-u-s-children-out-on-unequal-footing-a-summary-of-the-major-findings-in-inequalities-at-the-starting-gate/>.

GOV.UK. (n.d.). *Adult Skills Gap and the Falling Investment in Adults with Low Qualifications (HTML)*. [online] Available at:

<https://www.gov.uk/government/publications/low-skilled-adults-are-missing-out-on-training-the-skills-gap/adult-skills-gap-and-the-falling-investment-in-adults-with-low-qualifications-html> [Accessed 13 Jan. 2026].

House of Lords (2021). *House of Lords - Skills for every young person - Youth Unemployment Committee*. [online] Parliament.uk. Available at: <https://publications.parliament.uk/pa/ld5802/ldselect/ldythunemp/98/9806.htm> [Accessed 12 Jan. 2026].

Kaya, D. and Keşan, C. (2023). THE CONNECTION OF MATHEMATICS WITH REAL-LIFE SITUATIONS: PRESERVICE ELEMENTARY MATHEMATICS TEACHERS' PERCEPTIONS OF CREATING AND EVALUATING STORY PROBLEMS. *International Online Journal of Primary Education*, [online] 12(2), pp.118–135. doi:<https://doi.org/10.55020/iojpe.1135191>.

Numeracy skills interventions for adults (19+): A systematic review of the evidence. (2023). Available at: [https://assets.publishing.service.gov.uk/media/63d13bfdd3bf7f3c4df599f4/Numeracy\\_skills\\_interventions\\_for\\_adults\\_\\_19+\\_A\\_systematic\\_review\\_of\\_the\\_evidence.pdf](https://assets.publishing.service.gov.uk/media/63d13bfdd3bf7f3c4df599f4/Numeracy_skills_interventions_for_adults__19+_A_systematic_review_of_the_evidence.pdf).

OECD. (2025). *Adult numeracy skills*. [online] Available at: <https://www.oecd.org/en/topics/adult-numeracy-skills.html> [Accessed 13 Jan. 2026].

Officer, M. (2019). *The importance of numeracy as a life skill – The Education Hub*. [online] Blog.gov.uk. Available at: <https://educationhub.blog.gov.uk/2019/05/the-importance-of-numeracy-as-a-life-skill/> [Accessed 12 Jan. 2026].

Perry, C. (2025). 'Good' Technology Can Help Us Adapt To A Changing World. *Forbes*. [online] 5 Jun. Available at: <https://www.forbes.com/sites/chris-perry/2025/06/05/good-technology-can-help-us-adapt-to-a-changing-world/> [Accessed 12 Jan. 2026].

Public Health England (2015). *Local action on health inequalities*. [online] GOV.UK. Available at: [https://assets.publishing.service.gov.uk/media/5a80b62d40f0b62302695133/4b\\_Health\\_Literacy-Briefing.pdf](https://assets.publishing.service.gov.uk/media/5a80b62d40f0b62302695133/4b_Health_Literacy-Briefing.pdf) [Accessed 12 Jan. 2026].

Quaranta, M. (2017). How citizens evaluate democracy: an assessment using the European Social Survey. *European Political Science Review*, 10(2), pp.191–217. doi:<https://doi.org/10.1017/s1755773917000054>.

Raising Children Network (2023). *Developing Early Numeracy Skills*. [online] Raising Children Network. Available at: <https://raisingchildren.net.au/babies/play-learning/learning-ideas/early-numeracy> [Accessed 12 Jan. 2026].

Ravi, P. (2024). *Kritik - 14 Ways to Run Constructivist Activities to Enhance Peer Learning*. [online] [www.kritik.io](http://www.kritik.io). Available at: <https://www.kritik.io/blog-post/14-ways-to-run-constructivist-activities-to-enhance-peer-learning>.

Harris, R. (2023). *Numeracy is essential to levelling up, but more maths in schools may not be the answer*. [online] Geography Directions. Available at: <https://blog.geographydirections.com/2023/04/19/numeracy-is-essential-to-levelling-up-but-more-maths-in-schools-may-not-be-the-answer/> [Accessed 13 Jan. 2026].

Roberts, S. (2024). Why Democracy Lives and Dies by Math. *The New York Times*. [online] 24 Oct. Available at: <https://www.nytimes.com/2024/10/24/science/math-documentary-voting-abeles.html>.

Schleicher, A. (2014). *Why is numeracy important* | National Numeracy. [online] [www.nationalnumeracy.org.uk](http://www.nationalnumeracy.org.uk). Available at: <https://www.nationalnumeracy.org.uk/what-numeracy/why-numeracy-important>.

Skagerlund, K., Lind, T., Strömbäck, C., Tinghög, G. and Västfjäll, D. (2018). Financial Literacy and the Role of numeracy—How Individuals' Attitude and Affinity with Numbers Influence Financial Literacy. *Journal of Behavioral and Experimental Economics*, 74(1), pp.18–25. doi:<https://doi.org/10.1016/j.socec.2018.03.004>.

Stepney, E. and Lally, C. (2024). *Disinformation: sources, spread and impact Overview*. [online] Available at: <https://researchbriefings.files.parliament.uk/documents/POST-PN-0719/POST-PN-0719.pdf>.

van de Werfhorst, H.G., Kessenich, E. and Geven, S. (2022). The digital divide in online education: Inequality in digital readiness of students and schools. *Computers and Education Open*, 3(3), p.100100. doi:<https://doi.org/10.1016/j.caeo.2022.100100>.

View (2018). *Being good at maths could be good for your health*. [online] OECD Education and Skills Today. Available at: <https://oecdeditoday.com/being-good-at-maths-could-be-good-for-your-health/> [Accessed 12 Jan. 2026].

## **Element 2.**

### **The Role of Schools in Developing Numeracy Skills: Building**



**(EuroSchool, 2023)**

### **Foundations for Future Success**

Have you ever wondered why some students excel in math while others struggle? Behind this mystery lies a crucial question: What role do schools play in nurturing numeracy skills? Numeracy, the ability to understand and use numbers is more than just crunching numbers; it's a vital skill that influences everyday life, work opportunities, and lifelong learning. (Officer,

2019) Schools play a key role in this process by building students' knowledge, confidence, and problem-solving skills. (McCombs, 2015)



(londonsba, 2023)

In today's world, numbers are everywhere. From interpreting news headlines to managing personal finances and stepping into tech-driven careers, numeracy plays a quiet but powerful role in everyday life.(Nationalnumeracy.org.uk, 2024) That's why helping students build strong number skills early on matters so much. Schools sit at the heart of this effort, shaping how children learn to understand, use, and feel confident with numbers. Through thoughtful teaching methods and supportive education policies, classrooms become the training ground for lifelong numeracy.(Unlocking potential: Insights into improving teaching and leadership in mathematics education, 2025) So what does this look like in practice? And which approaches truly make a difference? Let's take a closer look at how pedagogy and policy come together to support numeracy development in schools.

### **Why is numeracy important?**

Imagine navigating a grocery store without the ability to compare prices or calculate discounts. Think about managing personal finances or understanding statistics in the news. Numeracy skills empower individuals to make informed decisions, participate actively in society, and pursue careers in science, technology, engineering, and mathematics (STEM).(Government Office for Science, 2017)



(<https://www.facebook.com/financialwolves>, 2020)

Numeracy isn't just about getting the right answer in math class, it's about learning how to think. When students work with numbers, they also build problem-solving and logical thinking skills.(royalsociety.org, 2023) They learn how to break problems down and figure out solutions step by step. These skills come in handy every day life, whether it's planning a trip, managing money, or understanding health information. And as technology becomes a bigger part of our lives, numeracy matters even more. Being able to read graphs, understand data, and make sense of digital information helps students confidently navigate the modern world.(Johnson, 2020)

Fostering strong numeracy skills is not a luxury; it is a necessity for thriving in modern society. Schools have a responsibility to equip students with these vital capabilities.(Gibb, 2015) But how do they do this effectively? The answer lies in employing innovative strategies and implementing supportive policies.

## **The Development of Pedagogy for Numeracy in Schools**

### **What are effective teaching strategies.**

Good teaching sits at the heart of strong numeracy skills. In the past, math lessons often focused on memorising rules and repeating the same types of problems. While memorisation can be useful, it's no longer enough on its own. Today, the focus is on helping students truly understand how math works and how it connects to the real world. Simple tools like blocks or counters can make a big difference, helping students see and touch ideas like addition and multiplication instead of just memorising them. (Lanigan, 2024)

One popular approach is conceptual learning, which encourages students to understand the why behind the math. Rather than just telling students to multiply numbers, teachers explain how multiplication is really repeated addition. This deeper understanding helps students feel more confident and makes math feel less confusing, and a lot more meaningful. (Walz, 2024)

### **Engaging Students Through Inquiry and Exploration.**



**(Edelytics, 2024)**

*How can teachers make math engaging? By encouraging inquiry and exploration! When students are prompted to ask questions like, “How can I solve this problem?” or “What happens if I change this number?” they become active participants in their learning journey. For example, exploring patterns or using real-life scenarios like shopping or cooking makes math relevant and interesting.*



*(Trockstars.org, 2018)*

*In addition, integrating technology, such as interactive math apps or virtual manipulatives, can transform the classroom experience. Such tools provide immediate feedback, adapt to individual learning paces, and motivate students through gamified elements. (Vetrivel et al., 2024)*

### **Differentiation and Inclusive Practice.**

*Every student learns differently. Some grasp concepts quickly, while others need more support. Differentiated instruction tailors lessons to suit diverse needs, ensuring no one is left behind. For instance, visual learners benefit from diagrams and charts, while kinesthetic learners thrive with hands-on activities. (Kanevsky, 2011)*

*Inclusive teaching practices identify and help overcome obstacles for students with special needs, language differences, or economic challenges. Techniques include breaking lessons into steps, showing concepts in different ways, and offering different types of assessments. (Schuelka 2018)*

### **Building a growth mindset.**

*A key part of teaching is helping students believe that they can get better at math with effort and persistence. Teachers can do this by praising effort instead of talent and showing students that mistakes help them learn. This way of thinking makes students more determined and motivated, helping them improve in math. (Stanford University n.d.)*

## **Policy Developments to Support Numeracy in Schools.**

### **National and local policies.**

Good math education needs strong policies that focus on teaching math well. Governments and schools have started programs like national math plans, teacher training, and updated curricula. These efforts aim to provide quality teaching for all students and use the latest teaching methods. For example, some countries use “Mathematics Mastery” programs, which help students fully understand math concepts before moving on. These policies also set goals and standards to check progress and find areas that need improvement. (Pratt & Alderton 2023)

### **Curriculum Design and Assessment.**

A good curriculum combines basic math with real-life problems, getting more complex over time. It focuses on problem-solving, reasoning, and linking math to other subjects like science or tech. Regular assessments, like quizzes and projects, check progress and help teachers give better support and fix mistakes early. (Ofsted 2023)

### **Teacher Support and Growth**

Teachers are key to good math learning. Ongoing training helps them stay updated on best practices and new tools. Support from colleagues and mentors builds a strong community. Using student data helps teachers tailor lessons and support struggling students. (Mobilemind.io, 2025)

### **Challenges and Opportunities**

Barriers like low resources, language issues, and math anxiety can make learning harder. To help, schools can offer extra support, bilingual materials, and create positive, stress-free environments. Teachers also need training to address emotional challenges.

### **Using Technology**

*Technology offers great tools, like personalized learning apps, online classes, and educational games. These make math more engaging and accessible, especially for remote or underserved students. (Zou et al. 2025)*

## **Conclusion**

Schools play a vital role in building math skills through innovative teaching and support. By fostering curiosity, offering personalized help, and using technology, we can prepare students for a confident, successful future. Working together, teachers, policymakers, and communities can ensure every student becomes confident in math and ready for tomorrow's challenges (Boadu & Boateng 2024)

*Boadu, SK & Boateng, FO 2024, 'Enhancing students' achievement in mathematics education in the 21<sup>st</sup> century through technology integration, collaborative learning, and student motivation: The mediating role of student interest', Eurasia Journal of Mathematics, Science and Technology Education, vol. 20, Modestum Ltd, no. 11, p. Em2534.*

*Edelytics (2024). Encouraging Curiosity Through Inquiry-Based Learning. [online] BGS Vijnatham School Tirupati. Available at: <https://bgsvtirupati.com/cultivating-curiosity-inquiry-based-learning/> [Accessed 20 Jan. 2026].*

*EuroSchool (2023). 10 ways to Improve Numeracy Skills in Primary Schools. [online] EuroSchool. Available at: <https://www.euroschoolindia.com/blogs/ways-to-improve-numeracy-skills-in-primary-school/> [Accessed 20 Jan. 2026].*

*<https://www.facebook.com/financialwolves> (2020). 10 Financial Statistics You Should Know (And Learn From). [online] Financial Wolves. Available at: <https://financialwolves.com/financial-statistics/> [Accessed 20 Jan. 2026].*

*Gibb, N. (2015). The purpose of education. [online] GOV.UK. Available at: <https://www.gov.uk/government/speeches/the-purpose-of-education> [Accessed 15 Jan. 2026].*

*Government Office for Science (2017). Future of Skills & Lifelong Learning. [online] Available at: [https://assets.publishing.service.gov.uk/media/5b51fbdae5274a3fd124c916/Foresight-future-of-skills-lifelong-learning\\_V8.pdf](https://assets.publishing.service.gov.uk/media/5b51fbdae5274a3fd124c916/Foresight-future-of-skills-lifelong-learning_V8.pdf) [Accessed 15 Jan. 2026].*

*londonsba (2023). Understanding the Basics of Financial Management. [online] London School of Business Administration. Available at:*

[https://londonsba.org.uk/blog/understanding-the-basics-of-financial-management/?srsltid=AfmBOopct9rmHHOIFbyIgN1VklESPpJ3SpB2omPDZ6hW0zS\\_xWeeNZ3t](https://londonsba.org.uk/blog/understanding-the-basics-of-financial-management/?srsltid=AfmBOopct9rmHHOIFbyIgN1VklESPpJ3SpB2omPDZ6hW0zS_xWeeNZ3t) [Accessed 20 Jan. 2026].

Johnson, R. (2020). *Why is Mathematics So Important in Our Everyday Life and Behaviours?* [online] The Superprof Blog - UK. Available at: <https://www.superprof.co.uk/blog/maths-and-the-modern-world/> [Accessed 15 Jan. 2026].

Kanevsky, L. (2011). *Deferential Differentiation: What Types of Differentiation Do Students Want?* *Gifted Child Quarterly*, 55(4), pp.279–299. doi:<https://doi.org/10.1177/0016986211422098>.

Lanigan, L. (2024). *Manipulatives in Maths - A Classroom Guide for Teachers*. [online] Maths – No Problem! Maths Mastery for Primary School Education. Available at: <https://mathsnoproblem.com/blog/teaching-tips/manipulatives-in-maths> [Accessed 15 Jan. 2026].

McCombs, B. (2015). *Developing Responsible and Autonomous Learners: A Key to Motivating Students*. [online] American Psychological Association. Available at: <https://www.apa.org/education-career/k12/learners> [Accessed 15 Jan. 2026].

Mobilemind.io. (2025). *From Observation to Action: How Data-Driven Feedback Fuels Teacher Professional Development*. [online] Available at: <https://www.mobilemind.io/from-observation-to-action-how-data-driven-feedback-fuels-teacher-professional-development> [Accessed 20 Jan. 2026].

Nationalnumeracy.org.uk. (2024). *Why numeracy is vital for financial inclusion | National Numeracy*. [online] Available at: <https://www.nationalnumeracy.org.uk/news/why-numeracy-vital-financial-inclusion> [Accessed 15 Jan. 2026].

Officer, M. (2019). *The importance of numeracy as a life skill – The Education Hub*. [online] Blog.gov.uk. Available at: <https://educationhub.blog.gov.uk/2019/05/the-importance-of-numeracy-as-a-life-skill/>.

Ofsted 2023, *Coordinating Mathematical Success: The Mathematics Subject Report*, GOV.UK, viewed 19 January 2026, <<https://www.gov.uk/government/publications/subject-report-series-maths/coordinating-mathematical-success-the-mathematics-subject-report>>.

Pratt, N & Alderton, J 2023, 'The policy and practice of mathematics mastery: The effects of neoliberalism and neoconservatism on curriculum reform', *The Curriculum Journal*, vol. 34, no. 4.

royalsociety.org. (2023). *Education and skills | Royal Society*. [online] Available at: <https://royalsociety.org/current-topics/education-skills/> [Accessed 15 Jan. 2026].

Schuelka, M 2018, *Implementing Inclusive Education*, Gov.uk.

Stanford University n.d., Growth Mindset and Enhanced Learning | Teaching Commons, [teachingcommons.stanford.edu](https://teachingcommons.stanford.edu), viewed 19 January 2026, <<https://teachingcommons.stanford.edu/teaching-guides/foundations-course-design/learning-activities/growth-mindset-and-enhanced-learning>>.

Ttrockstars.org. (2018). TTRockstars. [online] Available at: <https://www.ttrockstars.org/> [Accessed 20 Jan. 2026].

Unlocking potential: Insights into improving teaching and leadership in mathematics education. (2025). Available at: <https://estyn.gov.wales/app/uploads/2025/06/Thematic-report-Unlocking-potential.-Insights-into-improving-teaching-and-leadership-in-mathematics-education.pdf> [Accessed 15 Jan. 2026].

Vetrivel, S.C., Arun, V.P., R. Maheswari and Saravanan, T.P. (2024). Technology Integration in Online Learning Platforms: Blended Learning Gamification. [online] <https://www.igi-global.com/chapter/technology-integration-in-online-learning-platforms/353978>. doi:<https://doi.org/10.4018/979-8-3693-8217-2.ch011>.

Walz, S. (2024). 7 Ways to Develop Conceptual Understanding In The Classroom. [online] Third Space Learning. Available at: <https://thirdspacelearning.com/us/blog/conceptual-understanding-in-math/> [Accessed 15 Jan. 2026].

Zou, Y, Kuek, F, Feng, W & Cheng, X 2025, 'Digital learning in the 21st century: Trends, challenges, and innovations in technology integration', *Frontiers in Education*, vol. 10, Frontiers Media SA, no. 10.

### **Element 3.**

## **Maths Twister – Resource Overview Table**

### **Section**

### **Details**

**Purpose of the Resource (Skills Developed)**

Maths Twister is an interactive, physical learning resource designed to develop numeracy skills through movement and collaborative play. (Maths-Whizz, 2022)

The resource is intended to support:

- Mental arithmetic (addition, subtraction, multiplication, division)
  - Number recognition and recall
  - Problem-solving and reasoning
  - Mathematical vocabulary (e.g. greater than, less than, total, difference)
  - Concentration and listening skills
  - Confidence and engagement in numeracy tasks
- (CURRICULUM OVERVIEW FOR K -9 MATHEMATICS NEW BRUNSWICK MATHEMATICS GRADE 3 CURRICULUM GUIDE, n.d.)

By combining physical movement with mathematical questions, Maths Twister supports kinaesthetic learners and helps reduce maths-related anxiety by presenting numeracy in a fun, low-pressure format. (Warner, 2023)

**Learner Group Overview**

This resource would be suitable for individual learners or small groups of approximately 2–4 learners, typically aged 7–11 years, though it can be adapted for older learners with additional needs. (Department for Education, 2015)

**Ability Level**

- Learners working at or below age-related expectations in numeracy
- Learners who benefit from practical, hands-on activities

**Specific Barriers to Numeracy Learning**

Specific barriers to numeracy learning may include:

- Difficulty with mental maths and recall of number facts
- Low confidence or maths anxiety
- Short attention span or disengagement with written tasks
- Working memory difficulties
- Learners with SEND, such as ADHD, dyscalculia, or autism, who benefit from structured, interactive activities

**Demonstrating Learner Progress**

Maths Twister can be used to demonstrate progress by observing changes in accuracy, speed, confidence, and independence over time. (Burnett, 2017)

## **Measuring Progress**

Progress can be measured by:

- Recording the number of correct answers given during each session
- Noting the level of support required (e.g. prompts, number lines, peer support)
- Observing improvements in response time and willingness to attempt questions
- Increasing the difficulty level of questions and tracking success rates

For example, a learner who initially requires visual aids or peer support may later answer questions independently and correctly, demonstrating measurable progress.(Antalek et al., n.d.)

## **Use as a Self-Assessment Tool**

Maths Twister can be used as a self-assessment tool. Learners can:

- Reflect on which questions they found easy or challenging
- Identify patterns in mistakes (e.g. struggling with multiplication facts)
- Track personal scores or levels across sessions
- Set personal targets (e.g. “I want to answer five questions correctly without help”)(Nauman-Borton, 1996)

This encourages metacognition, allowing learners to take ownership of their progress and build confidence in their numeracy skills.(Global Metacognition, 2023)

## **References.**

### **References**

Antalek, C., Castro-Kemp, S., Dixon, F., Esposito, R., Hayton, J., Herbert, E., Kamenopoulou, L., Kolak, J., Loyd, D., Roberts, A., Romualdez, A., Somerville, M. and Taha, J. (n.d.). *Cross-cutting themes in identifying, supporting and collaborating for children and young people with SEND: a rapid evidence review Research report September 2025.*

[online] Available at:

[https://assets.publishing.service.gov.uk/media/68d6580c9ce370a7e0a0fd29/Cross-cutting\\_themes\\_in\\_identifying\\_supporting\\_and\\_collaborating\\_for\\_children\\_and\\_young\\_people.pdf](https://assets.publishing.service.gov.uk/media/68d6580c9ce370a7e0a0fd29/Cross-cutting_themes_in_identifying_supporting_and_collaborating_for_children_and_young_people.pdf).

Burnett, C. (2017). *Take the 'Work' Out of Maths Homework with Twister*. [online] Momtastic. Available at: <https://www.momtastic.com/parenting/694373-maths-homework-with-twister/> [Accessed 3 Feb. 2026].

CURRICULUM OVERVIEW FOR K -9 MATHEMATICS NEW BRUNSWICK  
MATHEMATICS GRADE 3 CURRICULUM GUIDE. (n.d.). Available at:  
<https://www2.gnb.ca/content/dam/gnb/Departments/ed/pdf/K12/curric/Math/Math-Grade3.pdf>.

Department for Education (2015). *Area Guidelines for SEND and Alternative Provision Including Special schools, Alternative provision, Specially Resourced Provision and Units Building Bulletin 104*. [online] Available at:  
<https://assets.publishing.service.gov.uk/media/5f23ec4e8fa8f57ac968fb11/BB104.pdf>  
[Accessed 3 Feb. 2026].

Global Metacognition (2023). *Metacognition in The Mathematics Classroom!* [online] Metacognition. Available at: <https://www.globalmetacognition.com/post/metacognition-in-the-mathematics-classroom> [Accessed 3 Feb. 2026].

Maths-Whizz. (2022). *Maths Twister Game - Maths-Whizz*. [online] Available at:  
<https://whizz.com/blog/maths-twister-game/> [Accessed 3 Feb. 2026].

Nauman-Borton, K. (1996). *ScholarWorks at UMass Boston ScholarWorks at UMass Boston Critical and Creative Thinking Capstones Collection Critical and Creative Thinking Program Thinking and Learning through Creative Movement in the Thinking and Learning through Creative Movement in the Classroom Classroom*. [online] Available at:  
[https://scholarworks.umb.edu/cgi/viewcontent.cgi?article=1217&context=cct\\_capstone](https://scholarworks.umb.edu/cgi/viewcontent.cgi?article=1217&context=cct_capstone).

Warner, M. (2023). *Twister Maths*. [online] Teaching Ideas. Available at:  
<https://www.teachingideas.co.uk/maths/twister-maths/> [Accessed 3 Feb. 2026].

## **Element 4.**

**Video Link:** <https://photos.app.goo.gl/1CxvmEuc2SFNn8Z69>

## **Element 5.**

### **Critical Reflection on Maths Twister as an Interactive Numeracy Resource**

Maths Twister, inspired by the traditional game Twister, is an innovative and interactive teaching resource designed to enhance numeracy skills through physical activity and collaborative play (Bethany, 2015). Its integration of movement with mathematical concepts aligns with contemporary pedagogical approaches emphasising active, experiential learning. To critically evaluate its effectiveness, it is essential to draw upon relevant educational theories, such as those of Friedrich Froebel and Jean Piaget, and consider evidence from direct observation, experimentation or sensory experience, potential advantages, disadvantages, and the inclusivity of the resource.

### **Theoretical Foundations and Pedagogical Rationale**

Friedrich Froebel, often considered the father of the kindergarten movement, emphasised the importance of play, hands-on activities, and the use of physical objects in early childhood education (Ryan, 2025). Froebel believed that play was a vital medium through which children develop their understanding of the world, fostering creativity, social skills, and cognitive development. His concept of "gifts" and "occupations" involved tactile, manipulative activities that promoted exploration and learning through movement and interaction (Scacchi, n.d.). From this perspective, Maths Twister reflects Froebel's principles by encouraging children to physically engage with mathematical concepts, transforming abstract numbers into real, kinesthetic experiences. It supports the idea that learning should be active, sensory, and rooted in play, which can foster a positive attitude towards mathematics and build foundational skills (Teach Active, 2025).

Jean Piaget's theories of cognitive development further underpin the rationale for Maths Twister. Piaget emphasised that children construct knowledge actively through stages of development, with concrete operational thinkers (typically aged 7-11) benefiting from hands-on, visual, and physical experiences that facilitate logical reasoning (McLeod, 2025). Piaget argued that for children to develop problem-solving skills and mental representations, they need opportunities to manipulate objects and explore their environment actively. Maths Twister offers such opportunities, enabling children to physically manipulate numbers and solve problems collaboratively (FOURNIER, 2022), this supports Piaget's belief that concrete, experiential activities are crucial for cognitive development in this stage.

### **Effectiveness of Maths Twister: Linking to the Numeracy Framework and Learning Theories.**

The Numeracy Framework advocates for a balanced approach combining practical, interactive, and reflective activities to develop numeracy skills. Maths Twister aligns with this framework by fostering key skills such as mental arithmetic, number recognition, recall, and problem-solving through movement and social interaction (Twinkl.co.uk, 2025). Its design encourages learners to internalise mathematical concepts in a multisensory manner, which can enhance understanding and retention.

Research indicates that kinesthetic learning activities can improve mental arithmetic by engaging multiple neural pathways, leading to better recall and faster problem-solving (Math & Movement, 2020). The physical aspect of Maths Twister can also support the development of spatial awareness and fine motor skills, which are interconnected with mathematical reasoning. The collaborative nature of the game promotes communication and learning with others, aligning with Vygotsky's social constructivist theory, which emphasises the importance of social interaction in cognitive development. When learners discuss strategies and negotiate answers during the game, they operate within their Zone of Proximal Development (ZPD), receiving scaffolding from peers and teachers (McLeod, 2025b).

### **Empirical Evidence and Observed Progress.**

Empirical studies and classroom observations suggest that active, movement-based activities like Maths Twister can lead to measurable improvements in numeracy skills (EEF, 2019). For example, learners often demonstrate increased confidence in mental calculations, faster number recognition, and improved recall after participating in activities like these regularly. Teachers report better engagement and motivation, particularly among learners who struggle with paper-based tasks. These findings support the view that active learning resources are effective in enhancing mathematical understanding, especially when designed to be inclusive and adaptable to different learning needs (Žakelj, Cotič and Doz, 2024).

### **Critical Analysis: Advantages and Disadvantages.**

While Maths Twister offers numerous benefits, it is important to critically assess its limitations and potential drawbacks. One advantage is that it caters to diverse learning styles like kinesthetic, visual, and social, making mathematics more accessible and enjoyable. Its interactiveness promotes teamwork, communication, and problem-solving, essential skills beyond numeracy (Alotaibi, 2024).

However, there are some disadvantages and challenges. Firstly, Maths Twister may not be suitable for all learners. Children with physical disabilities or sensory processing difficulties may find the activity frustrating or inaccessible, potentially leading to feelings of exclusion or failure. Differentiation becomes essential to ensure inclusive participation, which may require additional resources or adaptations (Applebaum, 2025).

Secondly, the physical activity involved might serve as a distraction for some learners, especially if the activity is not well-structured or if classroom management is not well managed. For children with attention deficit issues, the movement might overshadow the learning objectives, reducing its effectiveness (Applebaum, 2025). The activity's success depends heavily on the teacher's skill in scaffolding and guiding the activity to ensure learning outcomes are met.

Another limitation concerns the transferability of skills. While Maths Twister can improve engagement and understanding, educators need to ensure that the skills learned are transferred to more abstract, written forms of mathematics. Without proper follow-up and reinforcement, there is a risk that the activity remains a fun game rather than a meaningful learning experience (Numeracyteachersacademy.com, 2024).

### **Does Maths Twister Work for Everyone?**

The effectiveness of Maths Twister varies depending on individual learner characteristics. For kinesthetic learners, it offers an engaging way to internalise mathematical concepts. For social learners, the collaborative aspect fosters peer learning and confidence. However, for learners with physical disabilities, sensory sensitivities, or those who require more structured instructions, the activity may be less effective unless adaptations are made.

Furthermore, cultural and linguistic differences can influence how learners perceive and engage with the activity. For example, children unfamiliar with certain number concepts or language cues used during the game may require additional support to participate fully (Ntumi et al., 2026).

### **Conclusion.**

Maths Twister is a creative, active, and collaborative resource that reflects the principles of Froebel and Piaget by emphasising play, physical engagement, and active construction of knowledge. Its alignment with the Numeracy Framework and contemporary theories of learning underscores its potential to develop numeracy skills effectively, particularly in fostering engagement, motivation, and multisensory learning (Bethany, 2015).

Nevertheless, like any educational resource, it is not always the best resource to use. Its success depends on careful implementation, differentiation, and integration in the curriculum. It may not work equally well for all learners, especially those with specific needs or disabilities, highlighting the importance of inclusive practice (Numeracyteachersacademy.com, 2024).

Maths Twister exemplifies the value of movement-based, interactive learning in mathematics education. When used thoughtfully and inclusively, it can significantly enhance learners' numeracy skills, confidence, and enjoyment of mathematics, making abstract concepts real and accessible through the power of play and physical activity (Alotaibi, 2024).

## **References.**

- Applebaum, M. (2025). Fostering creative and critical thinking through math games: A case study of Bachet's game. *European Journal of Science and Mathematics Education*, [online] 13(1), pp.16–26. doi:<https://doi.org/10.30935/scimath/15825>.
- Bethany (2015). *Math Twister! {A Fun Indoor Math Game!}*. [online] Math Geek Mama. Available at: <https://mathgeekmama.com/math-twister-a-fun-indoor-math-game/>.
- EEF. (2019). *Let's get physical! How physical games can support maths understanding*. [online] Available at: <https://educationendowmentfoundation.org.uk/early-years/lets-get-physical> [Accessed 25 Feb. 2026].
- FOURNIER, C. (2022). *How Piaget's Theories Underpin Maths Mastery*. [online] Maths — No Problem! Available at: <https://mathsnoproblem.com/blog/teaching-maths-mastery/piagets-theories-underpin-maths-mastery> [Accessed 25 Feb. 2026].
- Ntumi, S., Adzifome, S.N., Nyamekye, T. and Vedor, F.K. (2026). Culturally responsive assessment in mathematical word problems and numerical cognition in multilingual education. *Scientific Reports*. [online] doi:<https://doi.org/10.1038/s41598-026-35864-0>.
- Numeracyteachersacademy.com. (2024). *The problem with maths games*. [online] Available at: <https://www.numeracyteachersacademy.com/blog/theproblemwithmathsgames> [Accessed 25 Feb. 2026].
- Math & Movement. (2020). *Kinesthetic Learning in the Classroom*. [online] Available at: <https://mathandmovement.com/what-is-kinesthetic-learning/> [Accessed 25 Feb. 2026].
- McLeod, S. (2025a). *Piaget cognitive stages of development*. [online] Simply Psychology. Available at: <https://www.simplypsychology.org/piaget.html> [Accessed 25 Feb. 2026].
- McLeod, S. (2025b). *The Zone of Proximal Development and Scaffolding*. [online] Simply Psychology. Available at: <https://www.simplypsychology.org/Zone-of-Proximal-Development.html> [Accessed 25 Feb. 2026].
- Ryan, P. (2025). *Friedrich Froebel: His Principles, Play Theory, and Legacy in Education*. [online] Early Excellence. Available at: <https://earlyexcellence.com/practice-and-pedagogy/friedrich-froebel-theory/> [Accessed 25 Feb. 2026].
- Scacchi, V. (n.d.). *SOCIAL AND CONCEPTUAL SPACES, FROEBELIAN GEOGRAPHIES* Resources of the Froebel Archive Collection at the University of Roehampton. [online] Available at: <https://files.froebel.org.uk/production/documents/Social-and-Conceptual-Spaces-1.pdf> [Accessed 25 Feb. 2026].

Teach Active. (2025). *Active Learning, Active Minds: Boosting Maths Through Movement*. [online] Available at: <https://www.teachactive.org/2025/10/moving-maths/> [Accessed 25 Feb. 2026].

Twinkl.co.uk. (2025). Available at: <https://www.twinkl.co.uk/resources/foundation-phase-welsh-primary-resources-classroom-management/curriculum-for-wales-cymru-wales/numeracy-framework-curriculum-for-wales-cymru-wales> [Accessed 25 Feb. 2026].

Žakelj, A., Cotič, M. and Doz, D. (2024). Evaluating the impact of active and experiential learning in mathematics: an experimental study on eighth-grade student outcomes. *Cogent Education*, 11(1). doi:<https://doi.org/10.1080/2331186x.2024.2436698>.