Numbers count

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In this essay we will look at why good numeracy is important and how it is impacted from school years to adults. It will look at social and political numeracy is linked and how it has developed.

First, we will look in to how numeracy skills have played a role in children's attainment to plan for interventions. These have proven to of made good progress through decades of support in schools (Catchup, 2020). In early years through to foundation phase the concrete, pictorial, abstract approach introduced by Jerome Bruner (National Numeracy, 2024). It shows that using objects such as numicon and cubes before moving onto pure numbers and the formation would benefit them by working through the three stages of representation. According to the latest research it follows consistency of the lesson and early identification by using assessments to find exactly where the extra support is needed (Education Endowment Foundation,2023).

Numeracy is more than just a school subject it is a life skill that acts against modern day living (Schleicher, 2014). When you get to terms with numbers, it doesn't mean you are better at maths but it shows a better understanding of navigating your everyday life and looks towards the future. Although mathematics and numeracy are relatively the same there is a slight difference. Mathematics focusses on what you need to work out the answer, where numeracy focuses on the how and why it works. It is the ability to use mathematical skills confidently and continuously in daily life, work, and to understand information (National Numeracy, 2024).

Numeracy is a range of different capacities such as subtraction, addition, multiplications, divisions and so on. Understanding numeracy gives you confidence in skills such as performing calculations with ease. Looking at charts and analysing graphs to get a conclusion and measuring the ingredients of cooking materials used in baking. Working out the measurements for ingredients does not sound as intense as having to sit there and write it down, but learning how to do it practically and having something to show at the end of the session gives more of a positive approach. Using money is a big part of numeracy, from the moment you step into a shop, looking for that change and working out any percentage you need deducted before you get to the checkout. Schools have incorporated money into their role play areas where a scene is set for them and they can explore and use knowledge from peers to play, but also learn and problem solve at the same time. As shown here numeracy can be combined into activities so it does not apply as your typical maths lesson.

Numeracy shows a disposition to many individuals. Adults and children feel anxious when it comes to numeracy, generally because they do not feel confident in using it (National Numeracy, 2019). Anxiety towards numeracy shows an avoidance to social situations, leading them to feeling embarrassed and socially excluding themselves from different groups. Having a poor understanding of numeracy can reflect on job opportunities and a slower career progression. In some cases this can lead to people

seeking alternative way of getting money to feed families and live. These situations are becoming more frequent which can lead to prison sentences, loss of family and homelessness. Not understanding numeracy can affect mental health in many people, the percentage varies in different age groups but the common age is roughly between 18 to 24 year olds. 22% of ages 18 to 24 say their mental health has suffered due to their struggles with maths. 23% of 18 to 24 year olds say the cost of living crisis has made them feel worse about their number skills (National Numeracy, 2024). This follows on to people then struggling to pay bills and survive in everyday life comfortably. The parents who struggle with literacy and numeracy are more likely to have children who struggle with the same. This can lead to a cycle of disadvantage that continues through generations (Shannon trust, 2024). Looking at prisons across the united kingdom and recent data from uk ministry of justice, they have carried out a number of numeracy assessments between 2024 and 2025, a 7% increase on the previous year. 69% were at Entry Level 1 to 3, meaning that most learners started below a GCSE grade which is the equivalent of the ages between 15 and 16 year olds (Novus, 2025).

Looking more into education we have PISA which stands for Program for International Student Assessment (National Center for Education Statistics, 2015). PISA is a global assessment conducted every three years, targeting 15-year-olds (Gov, 2024). It conducts how well students perform in maths, reading and science. Since 2000, PISA has involved more than 100 countries and economies and around 3,700,000 students worldwide. The latest study was published and released in 2023 and relates to the performance of students in 2022 (Gov, 2024). Theses dates were slightly behind due to the pandemic of covid 19 that hit globally in 2020. According to the graphs and data produced it showed that Wales had significantly dropped in scores declining by about 20 points which is about 20% decrease from previous years. This brought scores in Wales to their lowest ever level, significantly below the average across OECD which is the Organisation for Economic Co-operation and Development (OECD, n.d.) countries and significantly below those seen across the rest of the UK (Sibieta, 2024). Following on these findings the next data for PISA will be released in 2026 for the 2025 year (Organisation for Economic Co-operation and Development, 2024).

In this essay it has been discussed how important good numeracy can be to a child moving on to an adult. It is then shown in other aspects such as creativity, critical thinking and analysing data from recent sources. Data has shown how assessments of a child's attainment is used and the steps for where the interventions need to be revisited. It has looked into what happens when we do not have good numeracy and the outcomes that could arise from these problems as we grow into adults. Overall it has looked at the political and social side of numeracy and why good numeracy is important to everyone.

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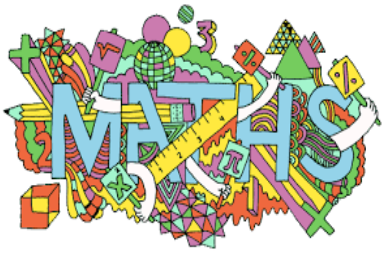

(Hester's Way Primary School, 2024).

Escape room……I'm just not a math person.

Cast yourself back to your school years. Its Monday morning and first lesson is dreaded maths. I can see you all smiling to yourselves now, especially if you were like myself. Mathematics was the least favourite subject in my school days, probably because it was boring, we did not have many resources and was just sat in front of the board and had to work the answer out independently most of the time. And in a whole, I just did not understand what I was being asked to do and asking for help would make me look silly.

"Is this really the way it should be delivered?"

I think to myself whilst delivering the dreaded maths lesson in school, surely there could be more to this? Make it fun, go outside, use random resources like spoons or even food, break the rules and draw on the table (a wet paper towel will fix this after) bet you had a little giggle to this especially if you work in a primary school, as a wet paper towel solves everything.

Turning the tide and make mistakes ok.

Children often dislike numeracy because they just do not understand.

Ask yourself this, would you enjoy doing something you had no idea about? I know I would not have any interest, and I am sure you are nodding your heads to.

Schools need to change this up immediately. Encouragement of how to handle the errors could show a massive impact on their confidence and growth towards the subject instead of the fear of getting it wrong. Instead of praising the child who gets full marks and understands what is being asked, switch it up and congratulate the individual who spent ten minutes working out that difficult equation. This will then encourage persistence over speed.

Mixed ages.

Most schools across the United Kingdom have introduced the reading buddies which is to encourage children to get more confident with reading especially in primary schools.

Older children in key stage 2 will come to foundation phase and early years student to read with them once a week Why not have this happen with numeracy. Get the children to take down resources and help with individual struggles, get them to play games involving numbers. This will eventually show the younger children that numeracy is a social skill that can made fun in different aspects of learning (Storytime for Schools, 2018).

Working in groups of mixed abilities could give a positive approach and teachers need to move around more and not make the whole sitting at a desk anxiety be a thing of the future.

Engaging out of school activities for families.

You are probably thinking oh dear I have not got time for this but hear me out. Think of all the times you've had to stop what you are doing and help your child with homework, more than likely it is quite a bit. An alternative to this could be if your school decided to host a family games night where you played numeracy games together and have a bit of fun with it. Take that stress away from you. After all who does not love a game of bingo where you have to look and listen for your number or a board game such as monopoly which involves a lot of numeracy such as, counting the money and giving change if you're the designated banker, rolling the dice, counting how many people until your next go, all without you even realising (Treneer, 2021).

Growth mindset

(Google, 2025)

This is a quote from a theorist called Jo Boaler. "There is some very strong evidence that what you believe about yourself will change how your brain works, so it's really no wonder that kids with a growth mindset are doing so well. Every time they make a mistake, their brain responds with more growth," (Bowen, 2021). Jo Boaler is currently a professor of mathematics education at Stanford University (Team, 2017). Her theory suggests that children most effectively learn working on problems they enjoy, rather than those they fear. Timed testing and blind memorization damage an individual's experience to numeracy (Stanford university, 2015).

Key outcomes of schools encouraging numeracy.

By encouraging numeracy, you are teaching them to think mathematically rather than do math. By having family maths nights, buddies from mixed ages attending the foundation phase and early years will hopefully reduce that dreaded anxiety of entering a maths lesson they hate. Having visual boards around corridors to show how much it is scheduled into the everyday routine.

A point to remember school should be fun for learning and have lots of educational support. Encouragement is key as most schools promote ambitious, capable, enterprising, and ethical learners which was set up along with the curriculum for Wales to show aspiration and for the children to become the best that they can be (Welsh Government, 2022).

I hope that whoever this is aimed at will take on board some of the key points and find out how numeracy isn't just about math it's about life.

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Numicon

Resource information sheet.

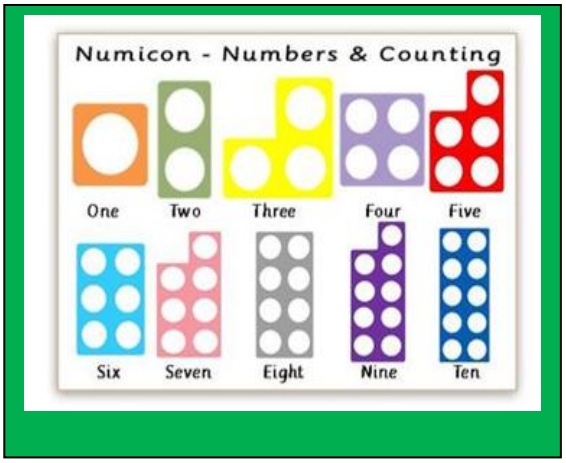
What are they and how can they be used?

Numicon is a multi sensory math resource designed to help children of any age and to understand numbers by seeing and feeling them (Marlow, 2023). They are flat, colourful plastic shapes with a specific number of holes. Each number from 1 to 10 has its own colour and distinctive shape.

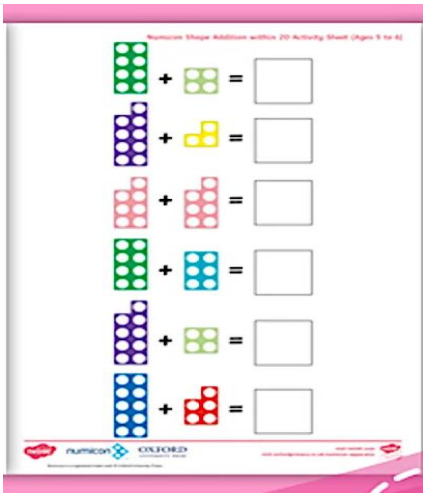
There are several different ways in which numicon can be used. They help to find the missing number to the equation or even used separately for counting to a certain number, depending on what you are looking to achieve. Some of the examples on how they support numeracy could be:

- Counting
- Addition
- Subtraction
- Place value
- Multiplication
- Division
- Reasoning
- Pattern recognition
- Problem-solving skills

(Early Years Resources, 2025).



(eBay, 2026).



(Twinkl, 2020).

- Numicon is primary intervention tool used in Wales to follow the Welsh curriculum (hwb.gov.wales, n.d.) for learners with dyscalculia and other learning barriers as it removes the fear of just seeing a number (kath, 2025).

- This way of leaning can be used to support different areas of numeracy and groups ranging from ALN which is the additional learning needs (Welsh Government, 2021) to the more able (SkyRocket Maths, 2025). It gives pupils an idea of what the value of each number looks like and that when we count in ones, the number gets bigger by the same amount each time. When counting numicon we add on one more hole each time we go up the number ladder (Marlow, 2023). It appeals to children's visual learning and sense of patterns. Numicon can be very beneficial to start off your math journey from early years but can also help key stage 3 students to figure out number bonds larger than key stage 2, modelling arrays and understanding their factors. It helps the children to understand why a formula works rather than how (Twinkl, 2021). Having the object as a visual and sensory can make the atmosphere a lot calmer and engaged.
- Numicon can be used to demonstrate progression through the different stages of age and ability. To start off you would expect the children to be familiar with the shapes and just to generally play until they begin to feel confident in combining the colours with the number. They then could move on to number recognition in some quick visuals of the numicon this would then progress onto subitising. When they have established the basic outcome, they should be able to progress onto ordering the numicon from 1 to 10 and demonstrating an understanding of showing one more or one less. Progress is then moved on to show number bonds and addition by using the individual holes in the shape to solve the number problem. For example, stacking a 2 piece on top of a 10 piece to show it leaves 8 as the missing number in the addition problem (Twinkl, 2021). Using this technique can also show a self-assessment being used as if there is a hole left hanging over the edge, they immediately should know that the answer is incorrect and to try again. Another self-assessment could be used in peer feedback and weekly intervention to target the understanding. When progress is fully developed then moving into the tens and ones would challenge them further.

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Video link for resource in action.

IMG_3255_1.mp4

Evaluation of resource.

Using numicon to find the missing numbers in a brilliant way to approach early numbers and the number sense. Representing the numbers as a physical shape and colour with a specific number of holes promotes the children to visualisation (Early Years Resources, 2025).

The strength for the activity is that it has a visual structure. Unlike coloured counters which are all the same shape and size, numicon shapes are very structured allowing the children to recognise the specific shape along with the colour and connect it with the number. It also shows a self-correction for the individuals to assess themselves. If a child is looking for the missing part of 8+_=10 they can physically overlay the 8 shape on to the 10 shape. The remaining empty holes show exactly which piece is missing, giving them the answer by either recognising the shape or counting the number of holes left.

The limitations of numicon are that children could become to dependant on the shapes and colours and struggle to transition to mental imaginary especially if the scaffolding is not faded out (Mulholland, 2025). There could also become a barrier if there was a child in class who was colour blind this would impose a lack of differentiation and a decrease in confidence. For a child who is colour blind, a good example could be to have the numicon in black and white so they can see that all even numbers are in black and all odd numbers are in white. Again, this will be easy for them to order and see the shape and pattern of the staircase that it forms when in the correct order (Towerhamlets, 2026). These are factors to look on and make alternative arrangements to suit individual needs. The first part of teaching if this happens could be to count the holes with 1:1 correspondence to identify rather than looking for the colour. This would be aimed at early years first starting off with numeracy and gradually these individuals will rely on the shape as they progress further up the line. Also, another critique could be that a child in the class could have a visual impairment. This could make the visualisation of numicon difficult. It can range from them being blind or colour blind. Moving on from this you could make the numicon into having a tactile footprint. A student could move their fingers over the holes to count or even have braille on top so they could piece together the staircase that the numicon forms. By changing a few modifications this can significantly enhance the experience and cover all needs for children.

There are several theorists linked to this resource. First is Jerome Bruner. Bruner was a constructivist. He believed that active materials prove progression from iconic to symbolic representation, also that learners construct their own understanding and are encouraged to solve and explore problems (Tomkinson, 2016). This is shown in the activity by the children understanding the value of the numicon to work out their answer correctly. Bruner's pedagogy theory suggests that learners actively construct knowledge rather than absorbing it (Tomkinson, 2016). Bruner also believed that scaffolding should be used whilst delivering a lesson. This can be done by explaining what is being asked of them and demonstrating it to the whole class, then let the children have a go at doing the activity whilst the teacher steps back and offers support and guidance when needed (Koblin, 2021). During a previous activity the children were aware of what was set and had a good understanding of the target needed to be met. In the video it shows that the children were able to understand that a 4 piece numicon placed on top of the 10 piece would give them the answer. When they realised that the 6 piece was missing, they could quickly identify that they fit together to complete the number sentence and could write it down correctly on the whiteboard. Next time the children need to be challenged more, other targets need to be brought into consideration by increasing

the equal amount into the teen numbers. Following on the second theorist this can also be linked to is Lev Vygotsky. Vygotsky was a psychologist who focused on developmental psychology (Helwig-Henseleit, 2025). He believed that language plays an important part in learning and if the delivery is not correct then the outcome will not be what is expected (Helwig-Henseleit, 2025). Vygotsky also believed that scaffolding was a crucial part to the children's learning. This is where the two theorist Bruner and Vygotsky are linked. Another key element to Lev Vygotsky pedagogy was Zone of Proximal Development (ZPD) this is closing the gap between what a learner can do independently and what they can achieve with guidance (Prince, 2025). His ideas have influenced teachers into using reciprocal teaching which is students and teachers show progression in comprehension through summarizing, questioning, and predicting (McLeod, 2025). This is shown in the video by talking the children through what they were trying to find. After finding the correct pieces the children were then able to assess their findings, this technique evaluates children's current understanding to set personal learning goals, aligning with the ZPD zone of proximal development framework. Finally inclusive education which is collaborative learning strategies that support diverse needs by mixing children with different abilities in shared tasks and encouraging the cooperative learning groups that they are familiar with (Prince, 2025). The two children that took part in the activity were from different ability groups. These were middle ability and a lower. The findings show as one could explore the correct answer more quickly. These theorists have been linked to the resource activity and proven that the different ways of teaching can help to understand the activity and follow the guidance plan.

Overall, using numicon to find the missing number to the problem has been proven to be a very tactile way of getting the children to independently assess their own work and work as part of a group. It ranges from being a resource that can be used over diverse needs and is used for numeracy not just a specific part.

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