

A Maths Mindset

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“We’re no good at maths in our family...”



What is a Growth Mindset?

- Carol Dweck (Professor at Stanford University) developed the theory in her book 'Mindset: The New Psychology of Success'
- People tend to fall into a Fixed or Growth Mindset
- Fixed Mindset - believe that intelligence/ability have a limit and cannot be changed
- Growth Mindset - that ability can be changed - it progresses as the result of practice and application
- Mindset can be very deep rooted and difficult to change if not challenged

Pupils with a 'Fixed Mindset'

- Research shows more girls have a fixed mindset than boys in maths
- 'Higher ability' pupils often have a fixed mindset; having always received praise for being 'clever', they won't take on further challenges for fear of losing that 'clever' label
- 'Lower ability' pupils with a fixed mindset perceive themselves as 'not clever' and only ever capable of tackling 'easy' tasks
- These children see 'failure' as something to be avoided, so stay firmly in their comfort zone

Why Maths is Different (I think!)

- We have a culture of those who ‘can’ and those who ‘can’t’ do maths - even amongst teachers - which is particular to maths
- There is a perceived division between the sexes which is reinforced by media - ‘girls do writing, boys do maths’
- Parents often have a very different experience of maths to the one we’re teaching and can ‘avoid’ discussing it with children. “Mum and Dad can’t help me with my homework so it must be genetic!”
- Lack of self-belief in maths can be perpetuated by families from one generation to the next - (it happened to me!)

Minding Our Language

- Using the language of progress rather than achievement
- James Nottingham's Sommelier story- recognising progress
- “You’re great at English but I know you struggle with your maths”. Child hears - “I can’t be good at both!” - John Hattie
‘Teacher’s estimate of achievement’ is #1 of 195 factors that improve outcomes
- Using ‘interesting’ rather than ‘difficult’ when describing tasks
- ‘Good girl’ label conditions so that when the struggle comes - some children do not have the strategies to cope
- James Nottingham (Learning Pit) ‘Labels Limit Learning’ TED talk

Minding Our Language

Praising effort, perseverance, motivation and progress

- Well done - you're learning to
- Good - it's making you think - that's how your brain is growing!
- Every time you practice, you're making the connections in your brain stronger.
- Be brave. Have another go. Maybe this time you could.....
- You've worked hard on this and you've succeeded because of....x,y,z (success criteria)
- That picture has so many beautiful colours. Tell me about them.
- You can use this mistake. Think about why it didn't work and learn from it.

Our language tells children what we believe and what we value.

Strategies

- **Ability grouping in maths is associated with lower achievement.** Both low and high achievers raise their achievement when ability grouping is given up. Interestingly, high achievers are the ones who most benefit. **DISCUSS!**
- **Use “low floor–high ceiling” open-ended maths tasks.** Puzzles, challenges, and real world problems, for which there is no one right way to get there, are more beneficial than “closed” tasks where the goal is to get the right answer. Students need to see maths as a “learning subject” instead of a “performance subject.”
- **Maths should never be associated with speed. Stop giving timed maths tests.** Stress shuts down the brain’s working memory, which is the part of the brain needed for the task in the first place. Timed tests are the early on-set of maths anxiety. Many of the great maths thinkers are slow and deliberate. **PROBLEM HERE!**
- **Mistakes are a valuable** - children should recognise this **Problem for LA and HA children**

Practical Ideas -The Skills Session

Developing Confidence and Fluency

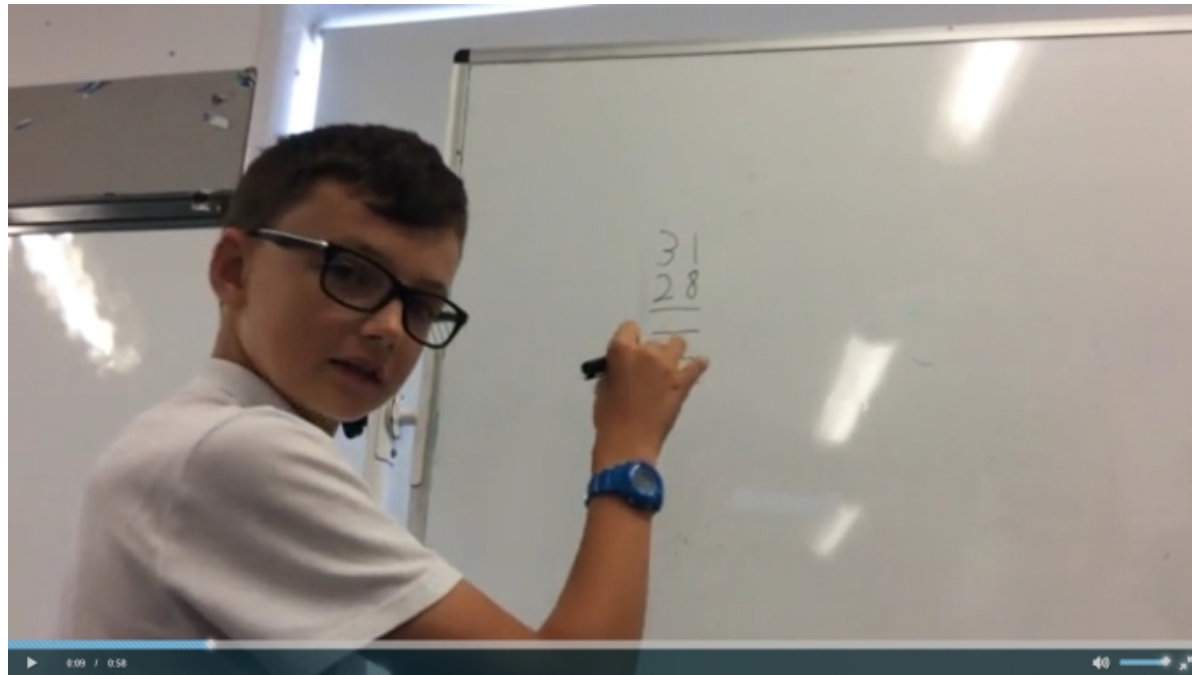
- Tackling basic skills through introduction of daily ‘Skills Session’ from 8.35am-9.05am
- Used for practice of key arithmetic skills - four operations, tables, fractions, decimals, percentages etc. Working on fluency.
- Opportunities for supported, paired and independent work children choose the setting in which they want to work promoting sense of ownership of their learning
- Time to conference individual children
- Opportunity for open ended tasks outside traditional lesson structure



Practical Ideas - Role of the Expert

Everyone can be an expert

- Children produce short videos in which they explain the concept and the pitfalls
- Opportunity to really engage with process/progress
- Engagement of children with low self esteem/fixed mindset
- Breaks down some barriers to learning e.g. confidence
- Tackles inherited attitudes to maths by sharing with parents on Learning Platform

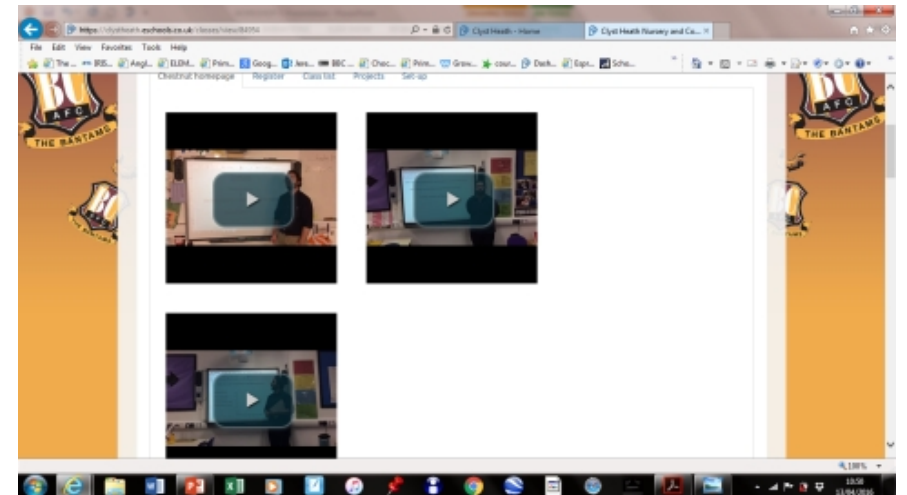


Modelling long
multiplication in Y6

Practical Ideas: Flipped Classrooms


Pre-teaching Key Skills - Parental Engagment

- ‘Flipped Classroom’ model enables children to develop confidence at their own pace
- Teacher videos posted on school Learning Platform weekly
- Allows trial and error; repeated attempts without stigma
- Popular with parents who can understand calculation methods and can engage with their own children
- Teachers can model a Growth Mindset



Practical Ideas: Rewarding Progress rather than Achievement?

- Classroom awards, house points, Golden Progress book, postcards home?
- Assessment and marking considerations?

Level	Mild	Hot	Spicy	Super Spicy
Angles 	I can identify right angles	I can recognise, measure and draw acute and obtuse angles I know that the sum of the angles on a line is 180° and the sum of the angles at a point is 360°	I know the sum of the interior angles of a triangle and a quadrilateral. I can calculate missing angles in triangles and quadrilaterals I can recognise, measure and draw reflex angles	I can calculate the size of an interior and exterior angles in a regular polygon. I can calculate missing interior angles and exterior angles in irregular polygons. I can identify alternate and corresponding angles and calculate missing angles on parallel lines.

A Growth Mind Set: A child's response - it can make a difference!

A growth Mindset means you're out of your comfort zone. You never give up. Your ability is not fixed especially in Maths. You can change it if you believe you can. Having a growth mindset means you push yourself out of your comfort zone. The learning pit is where you're stuck and you fall in and then you work hard and push yourself back ~~in~~ out. You know when you're out when you can explain it to someone else and push them ~~in~~ back in.

Thank You

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