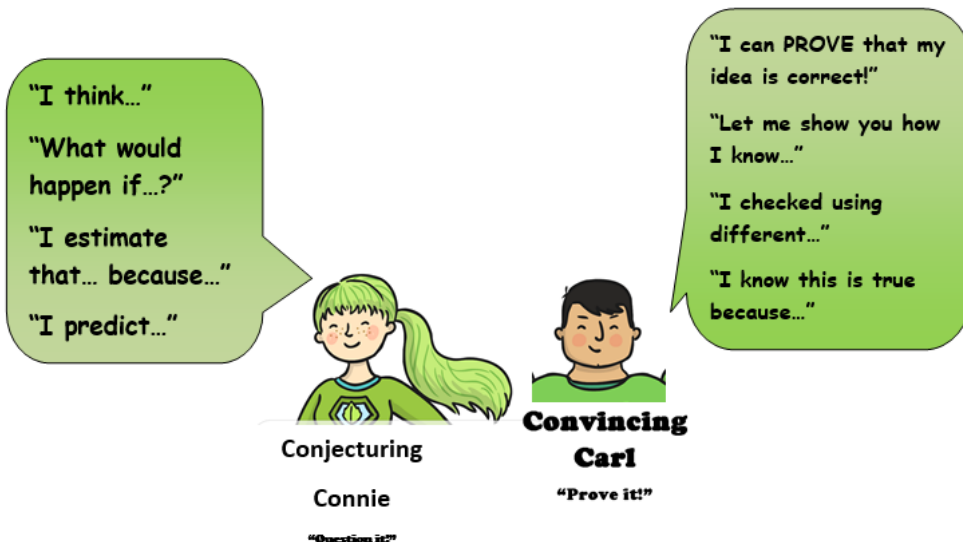


## Maths at CGPS

At Catton Grove, we believe that EVERY child is capable of achieving high levels of attainment and progress in mathematics. We believe that maths should be a collaborative, discursive and imaginative subject which encourages learners to think about concepts deeply and explore them in many different ways. We do not believe in setting pupils as we believe this is detrimental for their self-esteem and does not support our belief that all pupils can achieve in mathematics. We follow a mastery-style approach to teaching mathematics in which almost all pupils will follow the same journey through the concepts tackling problems which are low threshold, high ceiling alongside fluency questions at the appropriate level.



We use the **Thinking Powers displayed by our Superheroes** to enable pupils and staff to think deeply about a concept. These powers include: conjecturing, pattern-spotting, classifying, convincing, generalising and representing. Children from Year 1 will use these thinking powers to articulate their learning and understanding. In order to facilitate discussion in mathematics **we use a range of CLIPS** (Cooperative Learning Interaction Patterns).



"I noticed that..."

"The pattern goes like this..."

"The next one will be..."

"Each time, the change is..."



**Pattern-spotting Peter**

"Notice it!"

"I can show you using..."

"I checked my answer using..."

"The strategy I used was \_\_\_\_ because \_\_\_\_"

"Let me show you another way to solve it!"

"I used concrete, pictorial and abstract methods"



**Representing Rita**

"Show it!"

The important link between them is...

The connection I spotted was...

When I saw this, it made me think of...

I already knew \_\_\_\_ so this helped me work out \_\_\_\_.



**Connecting Kim**

"Link it!"

"My pattern is true for each example I've tried. I think I've found a MATHS RULE."

"Using my rule, I can explain the pattern..."

"My rule helps me to predict that..."

"I can explain why/when/how the pattern occurs."

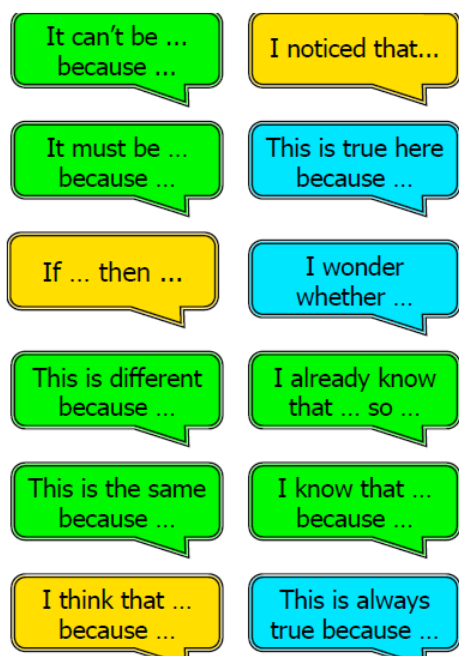


**Generalising Jack**

"Find a rule!"

We believe that pupils will have a better understanding of an idea when they are given the tools to represent their ideas in concrete, pictorial and abstract ways. Children all the way up to Year 6 are encouraged to use concrete and pictorial representations, especially when learning new concepts or solving problems.





We want learners to be able to articulate their thoughts accurately using the correct vocabulary. We use **magpie walls** to display new mathematical vocabulary and will **pre-teach** pupils who may need additional support with this in order to access the forthcoming lessons. We give pupils **opportunities to verbalise** or write down their ideas regularly in lessons to practise this vocabulary. We also **model the correct vocabulary** in every lesson and ensure that key words and phrases are repeated by the pupils. Furthermore, learners should be developing their ability to explain, reason and justify their ideas through making conjectures, noticing patterns and making connections to other mathematical concepts or representations.


We want learners to be able to tackle difficult problems creatively and resiliently using a range of metacognitive strategies throughout. At CGPS, we believe that making connections between problems,

strategies, concepts and representations is an essential component to becoming an excellent mathematician. We want learners to understand the relevance of mathematics and identify how it relates to other areas of the curriculum - including through transferable problem solving skills. Adults will explain how a new concept is used in daily life and make efforts to use mathematical skills in other areas of the curriculum. The Thinking Powers and problem-solving skills are also utilised across the curriculum.

We have **daily number time / maths meetings** across the school to embed key number and calculating skills for each year group which help to remove barriers for children when problem solving. We use formative and summative assessments to identify pupils who need additional support and with which concepts in order to give interventions and support appropriate to the age and stage of the learner. This often takes the form of same day intervention in the afternoon after the morning's maths lesson. We also use Times Table Rockstars in KS2 and NumBots in KS1 and LKS2 to support the embedding of essential fluency. Success in times tables is rewarded with certificates and stars worn on the pupils' lapels.



When trying to solve a maths problem, we talk to the pupils about **metacognitive strategies** and have displays or prompt cards in classrooms to support the use of these strategies independently. Adults in the school model **making connections whenever possible** and encourage pupils to do the same.



## Metacognitive Questions

**Ask yourself these questions when completing a task to help you reflect on your learning!**

<p style="text-align: center;"><b>1) Planning</b></p> <p>During the <b>planning</b> phase, learners think about the learning goal the teacher has set and consider how they will approach the task and which strategies they will use. At this stage, it is helpful for learners to ask themselves:</p> <p style="text-align: center;"><b>What am I being asked to do?</b></p> <p><b>Do I understand what I need to achieve?</b></p> <p style="text-align: center;"><b>Do I need to re-read the task again?</b></p> <p style="text-align: center;"><b>Which strategies will I use?</b></p> <p style="text-align: center;"><b>Is there a logical place to begin?</b></p> <p style="text-align: center;"><b>What equipment or resources might I need?</b></p> <p><b>Have I seen something like this before?</b></p> <p><b>Are there any strategies that I have used before that might be useful?</b></p> <p style="text-align: center;"><b>Do I understand what success will look like?</b></p>	<p style="text-align: center;"><b>2) Monitoring</b></p> <p>During the <b>monitoring</b> phase, learners implement their plan and monitor the progress they are making towards their learning goal.</p> <p style="text-align: center;"><b>Is the strategy that I am using working? Could it be more effective?</b></p> <p style="text-align: center;"><b>Do I need to try something different?</b></p> <p style="text-align: center;"><b>Should I use a different representation or resource?</b></p> <p style="text-align: center;"><b>Do I need to start again?</b></p> <p style="text-align: center;"><b>Is this really my best work or do I need to put in more effort?</b></p> <p style="text-align: center;"><b>Do I need to ask for some help?</b></p>	<p style="text-align: center;"><b>3) Evaluating</b></p> <p>During the <b>evaluation</b> phase, students determine how successful the strategy they used was in helping them to achieve their learning goal. To promote evaluation, students could consider:</p> <p style="text-align: center;"><b>How well did I do?</b></p> <p style="text-align: center;"><b>What went well?</b></p> <p style="text-align: center;"><b>What didn't go well?</b></p> <p style="text-align: center;"><b>What could I do differently next time?</b></p> <p style="text-align: center;"><b>Could I make it better?</b></p> <p style="text-align: center;"><b>How does it compare to the WAGOLL or modelled example?</b></p> <p style="text-align: center;"><b>Could I have used a more efficient method or more suitable representation?</b></p> <p style="text-align: center;"><b>What other types of problem could I use this strategy for?</b></p>
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We give parents the opportunity to join in with maths during our maths cafés, at our STEM fortnight exhibition and during home learning opportunities. Our learners are given additional support through breakfast clubs, booster sessions in groups, 1:1 interventions and Gifted and Talented competitions or workshops at other schools.

