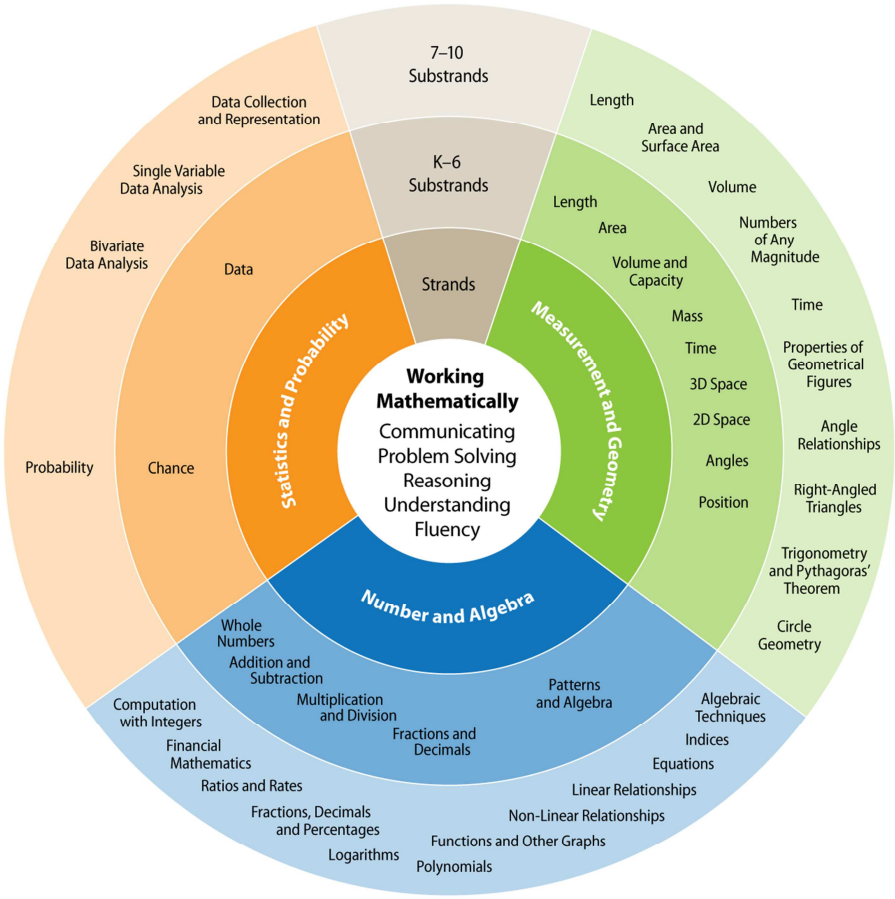
Learning mathematics is about understanding and mastering content and skills. The **content** includes topics such as algebra, trigonometry and probability. In the NSW syllabus, the **skills** are called *Working Mathematically*:



The diagram represents the relationships between the strands and substrands only.
It is not intended to indicate the amount of time spent studying each strand or substrand.

The five components of Working Mathematically describe how content is explored and developed – that is, the practical doing of mathematics. They represent ways of thinking that apply to all topics, and areas that we want all students to develop in. For each of the components listed on the left, this table explains what each is, why it's important and what that means for us as teachers.

Component	Description	Why it matters	Illustration	Implication
Communicating	**Expressing** ideas in a way others can see. Important keywords: *Describe, represent, explain… situations, concepts, methods, solutions… verbally, visually, symbolically.*	An idea is more powerful when it can be **shared**, and communicating is what lets a group of people share a single thought.	Seeing something, and then **describing** it to someone else so they can visualise it too and recognise it when they meet it in the future.	Students must be able to **show** their thought processes through clear **working** and **diagrams** – not just give the right answer at the end!

Component	Description	Why it matters	Illustration	Implication
Problem Solving	Knowing and picking effective **strategies** for working through problems. Important keywords: *Interpret, formulate, investigate, plan and verify.*	Mathematics is not just interesting and elegant, it can be **useful** and **effective**. Problem solving takes understanding and applies it to an actual scenario.	**Navigating** your way from A to B in an unfamiliar environment.	It's really important to phrase questions in many different ways, so that students become familiar with using skills in a **variety** of **contexts**.
Reasoning	Using **logic** to argue for why things are true or false. Important keywords: *Analysing, proving, evaluating, explaining, inferring, justifying and generalising*	Reasoning is the way that mathematicians make **progress**: they take things they already know and **build** on them through sound logic to form bridges to new knowledge.	**Forensic investigators** pull together all the **evidence** and combine them logically to unravel a mystery.	**Link** together the steps you take in approaching an idea or problem so it's clear why you move from one idea or skill onto the next.
Understanding	Seeing and using the **connections** between ideas.	When you actually "**get**" how something works, you can see **through** it to other problems. You can also take advantage of patterns once you recognise them.	**Remote control**… they aren't just magic buttons. There's an infrared sensor; you point it AT the television and that's how it works!	Work to understand the **relationships** between all the different ideas in maths so that our students can see, appreciate and make use of them.
Fluency	Working with tools and methods **quickly** and **accurately**.	Enables **efficiency** and frees up the mind to **think critically**. It's just like fluency in a language: you can listen and speak without actively thinking, which allows you to focus on what things mean and what you actually want to say.	Being able to read words and sentences without having to pause on the identity of each letter and meaning of each word allows you to **discover** and **become lost** in a story.	Students need to develop more than just rote familiarity with skills and processes, but not less. Fluency is the necessary **building block** and **enabler** of all the other skills – so we should devote time to building and strengthening it.

Taken together, these five key skills represent the full range of abilities that students develop and demonstrate while they grow as mathematicians. In a real way, they form a definition for what it means to be a mathematician: someone who can clearly convey their thoughts, unravel new and unfamiliar problems, draw logical conclusions, identify patterns and relationships between ideas, and confidently work through complicated processes and concepts.