

Exploring the learning areas: Mathematics

Transcript of video

Online professional development Semester 2 2011

This video is available for viewing at <http://www.qsa.qld.edu.au/15812.html>

Speaker: Welcome to this online professional development for the Australian Curriculum: Mathematics.

I'm going to take you through the Mathematics learning area. There is also a booklet you can use to follow along, so when I'm referring to activities in different sections those will be in the booklet.

The first thing I would like to look at is a bit of a snippet of a clip from Professor Peter Sullivan from Monash University. He was the lead writer for the shape paper for the Australian Curriculum Mathematics.

(Video excerpt. Original video can be viewed in full at: www.australiancurriculum.edu.au/Mathematics/Introduction)

One of the things we can do with any new curriculum is to actually stop and reflect on what we are actually trying to do as educators in our particular learning areas. As part of this professional development, I think it's important that we take stock of what we are trying to do as mathematics educators and to think of what is the purpose and aims of this new curriculum. It's an opportunity to reflect on what you value about mathematics and, in particular with the Australian Curriculum, one of the things we want to do is to consider what the verbs of the mathematics curriculum are as we will see as we talk about the proficiency strands. One of the things Peter Sullivan emphasised is the fact that this is a curriculum with plenty of opportunities for teachers to shape it in a way that suits their own interests and the interests of their own students.

Let's begin by looking at the rationale and aims for the Australian Curriculum: Mathematics. The rationale really serves a couple of different purposes. The number one purpose, really, is to define what mathematics is all about. What is the nature of mathematics as a discipline? It also needs to tell us about mathematics as a learning area itself, as a part of a curriculum. What purpose does mathematics serve in the curriculum? It's one of those things, with a subject like mathematics, it's a no brainer. It has to be there — it's maths. Of course you are going to be teaching mathematics in any curriculum. But the job of the rationale is to say, well in this particular curriculum what is it about mathematics do you want the students to look at? Why is it important? Why is it special? All the different aspects of mathematics that we will be looking at, how is it shaped up in the curriculum in particular?

The aims of the curriculum flow on logically from the rationale. They give some big-picture objectives for the mathematics curriculum. It makes sense if you're thinking about how the curriculum is constructed. You start with the rationale. It gives you the big picture about the learning area, what's the nature of the learning area, how it fits into the curriculum, and it gives you some more specific objectives and the aims. And then flying on from that you should see the rest of the logic of the curriculum, how the course of the curriculum areas are put together, the different strands they use and so on. Activity 3.3: Rationale and aims is in your workbook as well.

One of the things you can do is actually try and pick out a couple of little snippets from the rationale and aims and use those as a focus itself. This is actually something the curriculum is asking us to look at mathematics from these different angles, these different lenses that we can look at mathematics through. So, it's not simply about the different strands — Measurement and Geometry, Number and Algebra, Statistics and Probability. It's actually looking at some of these different angles we can look at the curriculum through. And that's one of the things I'd actually like to do in this professional development is actually take a different lens to look at the mathematics curriculum. But in order to go a bit deeper into one of the particular areas, we're going to pick a particular lens to look through. And so, as you see here, our focus for today really is going to be looking at the proficiency strands.

Before we get into that, however, one of the main things to note, obviously, is how is the mathematics curriculum organised? Please, do make sure you go to www.australiancurriculum.edu.au to have a good look at the mathematics curriculum if you haven't already. But obviously, in terms of the learning areas we have the content strands with Number and Algebra, Measurement and Geometry, Statistics and Probability. Those also have their own sub-strands — Number and place value, Fractions and decimals, etc. As you can see there too, some of those sub-strands begin and end at different times, so that is something to be aware of. That being said, you can still see the logical progression of a lot of those concepts, even if they say they are ending at a particular time or beginning at another time. A good example of that is Fractions and decimals is Years 1–6 and Real numbers is 7–10. But if you look in Year 7 Real numbers descriptions, it's all pretty much Fractions and decimals in Year 7 anyway. The other thing, as I've already mentioned, sitting behind that are the proficiency strands, which are embedded throughout the mathematics curriculum content descriptions. And of course, sitting behind that we have things like general capabilities and cross-curriculum priorities as well.

Let's talk about those proficiency strands — Understanding, Fluency, Problem Solving and Reasoning. Hopefully those kinds of terms won't be too unfamiliar to Queensland mathematics teachers because we have been used to using the Ways of working in the *Essential Learnings*, which we will talk about a little bit later on. What I would like us to do is to focus on the big-picture story of Understanding, Fluency, Problem Solving and Reasoning, and what they're all about. So in the organisation of the mathematics curriculum tab on the

Australian Curriculum website, you can see those descriptions. And also they are in your booklet.

(Video excerpt. Original video can be viewed in full at: www.australiancurriculum.edu.au/Mathematics/Introduction)

As Peter Sullivan was explaining there, the proficiency strands are really the verbs of the Australian Curriculum: Mathematics. They're how the students do the mathematics. In the activity 3.6, which is in your booklet, what I would like you to do is to actually look at what are some of those key verbs or terms that describe the different proficiencies? And then can you summarise each of the proficiencies in one sentence?

These next slides aren't exactly the answers to the questions I proposed just before. But again, it's just a way about thinking about breaking down the proficiencies in some memorable short sentences and some of the key terms that might apply to those. The important thing to remember, however, is these are embedded throughout all those content descriptions. Even though you can see different instances of content where some of these things might be emphasised more than others, obviously throughout all the different types of strands that are being studied — Number and Algebra, Measurement and Geometry, Statistics and Probability — all those different proficiency strands will also be demonstrated with the students doing the mathematics.

One other area where the proficiencies are really evident is the year level description. In all the learning areas, you will see a description of the year level that gives you a broad overview of the things that are being done in that year. The proficiency strands in mathematics are very evident in these. You have a description at each year level of each proficiency strand. Don't read that as a list of the only things they would do for each of those proficiencies — they really are just an example of the types of things that could be done in the year with the different content descriptions and the different proficiencies. Do make sure you go back to those big descriptions and have those in your head about what is understanding, what is fluency, what is problem solving and what is reasoning. Don't just tie those particular things to the particular content that is listed in those year level descriptions — they are really just up there as an example of the types of things that you would do say, for example, in Year 4.

In this next section, we are going to start comparing the Australian Curriculum: Mathematics to the Queensland *Essential Learnings*, and have a look at some of the mapping that the QSA has produced. Before we do that, listen to Peter Sullivan as he is talking about the new Australian Curriculum in comparison to some of the state and territory curricula.

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Hopefully the Australian Curriculum: Mathematics won't look too foreign to most of you, because as you will see there, some of the ways that it's organised is really quite similar to the Queensland curriculum. There's obviously not a one-to-one match. The content

descriptions and the organisers of the *Essential Learnings* are pretty close. The proficiency strands have similar ideas to the Ways of working. But they are definitely their own distinct versions of those — Understanding, Fluency, Problem Solving, and Reasoning, so I wouldn't try to do a one to one analogous comparison between those things. But, understand there is similar intent to the way those proficiencies are meant to be used.

Our curriculum mapping documents are all available on the QSA website. We essentially organise them under three different ways of looking at the new curriculum. We identified hotspots where new content that's not currently included in Queensland curriculum at any year level or a big change in focus. We identified movement of curriculum, so where different content may have moved up or down a year level, and also any other possible areas where bridging learning experiences might need to be done. One other thing to bear in mind when you're looking at the mapping is that we mapped words in documents against one another, and the Australian Curriculum, by its very nature of having a content description for each year level, is more specific than the Queensland *Essential Learnings*. So there might be some content that we have identified as a hotspot that we would know would actually be being taught in Queensland. From my experience, most teachers look at the mapping, and where we have said there are hotspots or shifts or areas where there might be bridging content, most people say: "Oh yeah, but we're doing that anyway". Or: "We have to move that around slightly, or we might have to have more of a focus on this". But, generally speaking, most people have found they're covering already what the Australian Curriculum expects them to do.

The activity in the booklet is comparing the Australian Curriculum: Mathematics to the Queensland *Essential Learnings*. Can you have a look at some of the mapping for a year level of your own choice and consider the implications it has for your own planning?

That brings us to the end of this little session. But I just want to take us back to the beginning where I talked about the fact that there are many different lenses we could look at this curriculum through, and we really did focus on the proficiency strands. But there's also other ways we can look at this curriculum too, and we could look at how mathematics links to science and to English or even history as well. And then, of course, the other learning areas that are coming in Phase 2 and 3 and other things you are doing in your school. So there are different angles we can look at, and that's certainly something the curriculum writers really took into account when they were developing the mathematics curriculum.

Here is a little clip with Peter Sullivan again talking about those aspects. Hope you've enjoyed today's presentation and good luck with your implementation of the Australian Curriculum.

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