**Katerina Poropat:** Good afternoon, everyone, and welcome to today’s webinar – Introducing the Victorian Curriculum Science 7-10. My name is Katerina Poropat and I am the project manager in the Victorian Curriculum F-10 unit here at the VCAA. It’s my great pleasure to introduce you to the curriculum manager for science, Maria James, who will be leading our presentation today. I would also like to thank Alicia Farrell, also from the F-10 unit, who has done a lot of the work behind the scenes to make this webinar possible today.

So, before we begin, we will start with an acknowledgement of country.

I would like to acknowledge the traditional custodians of the many lands across Victoria on which each of you are living, learning and working from today. For myself and those of us in the Melbourne metropolitan area, we acknowledge the traditional custodians of the Kulin Nations. When acknowledging country, we recognise Aboriginal and Torres Strait Islander peoples’ spiritual and cultural connection to country and acknowledge their continued care of the lands and waterways over generations, while celebrating the continuation of a living culture that has a unique role in this region. I would like to pay my respects to elders past, present and emerging, for they hold the memories, traditions, culture and hopes of all Aboriginal and Torres Strait Islander peoples across the nation, and hope they will walk with us on our journey.

So, before we get into the presentation, I’ll briefly go over some housekeeping. Please note that the chat function is only being used to share relevant information and links from the VCAA. You will notice that a Q&A box has been set up, so please use this to put your questions and comments in, as this will help us ensure that we attend to all your queries and we don’t miss anything. When you use the Q&A box, please make sure you select all presenters so that all panellists can see your questions as they come in. We will answer these in a couple of ways. Firstly, we may type a response directly into the Q&A box, which all participants will be able to view, or we will have a dedicated Q&A session at the end of the presentation, where Maria will address these queries. A number of questions also came through during the registration process, and these will be addressed during the session.

The second part of our housekeeping is to let everyone know that this session is being recorded. A copy of both the recording and the PowerPoint, plus a transcript, will be loaded onto the VCAA’s F-10 resources webpages under the Professional Learning section. A copy of the recording and PowerPoint will also be emailed to participants in the coming days. So without further ado, Maria, I’ll hand over to you for our presentation today.

**Maria James:** Thanks, Kat, and hi, everyone. Just to let you know, I’m turning off my video because I’ve got low broadband width here at Fairhaven, so it’s not that I don’t want to see you or to have any visuals but it’s just... It makes it more stable.

OK, so the objectives today, as you would have known from the intro and the invite, is really an introduction. So it’s to provide an overview of the curriculum for 7-10 science, and it’s really to enhance understanding of the structure of it. So looking at the strands, sub-strands, content descriptions and the achievement standards, planning opportunities, assessment and some resources that are available. So it is very much an overview. Thank you to those who sent questions in. Actually, they could almost become sessions on their own, which we might think about in terms of supporting you in the future – for further webinars.

So the first part that I’m going through is just the general structure of the science curriculum.

So, as for all studies...all subjects in the curriculum, they each have, in a sense, two different ways of introducing them and presenting them on the website. So there’s an introduction that includes the rationale and aims. It has a structure of the learning area. We have a specific learning in science and what that’s about. Then we have a scope and sequence, a resources, and glossary section. And I’ve highlighted the scope and sequence, because I find that really useful, because you can download, on a single A4, A3 sheet, the whole curriculum for 7-10. So it’s got on one side the Science Understanding and the other side the Science Skills. And it’s just a really nice reference point for you to be able to access. So I tend to use that quite a lot, but there are different ways of accessing the curriculum.

So the second part of our resource online is the curriculum itself. So it’s where it sets out the learning continuum. That offers a range of viewing options. So you can do that by selecting a view mode or you can select a particular level or band within the curriculum area. And it does include the level and band descriptions, the content descriptions organised by strands, and the achievement standards. So it’s quite... It’s relatively easy to access and to have a look at.

There are some particular Victorian Curriculum vocabulary, and especially if you’re new to teaching science or teaching in Victoria, you really need to understand, in a sense, the language of the curriculum. And this applies across the board to all studies. So if you’re teaching more than one subject, you’re going to actually have these terminologies common across there.

So we talk about achievement standards. And they’re the standards that describe what students should be able to do – understand and do. And we base our reporting on those achievement standards. The content descriptions outline what you’re expected to teach and what students are expected to learn. So they are specific and discrete and they’re all coded, so that you can refer them and cross-reference them, and in your planning, you can make sure that you’ve covered the whole curriculum. The elaborations – and the first word there, and it’s really important, is that it’s non-mandated. A lot of people think that the curriculum includes the achievement standards, the content descriptions and the elaborations – and it makes it look huge if you take that into account. So the only mandated parts of the curriculum are actually the achievement standards and the content descriptions.

And again, if you go back to that view, that one pager, you can see that it actually is quite doable. So the elaborations are not mandated, but they do provide some advice about what those content descriptions and achievement standards might look like in terms of a classroom activity or a learning opportunity. There are also some band descriptions. We don’t have it by levels. So maths and English have a curriculum by levels. We have it by bands. So, different year-level bands. And those statements provide an overview about what that’s generally about. So you can use that for advertising what science is in curriculum booklets etc.

And basically, the whole curriculum is based on strands and sub-strands. So the strands are the key organising elements and then the sub-strands are subcategories within those particular strands. And I’ll go through those in a moment.

OK, so when you open onto that introduction section, I said there were a set of things there – the rationale and aims, the structure - I’ve mentioned all of those. Again, you can just click onto each of those tools, bars, at the left side of the screen and you can access particular information that you want there. So I’ve just captured there what it looks like – this is what the rationale and aims looks like. If you scroll down to the next bit, the next tab, the structure, the learning in science, you can access what you want. But I do highly recommend that you have a look at the scope and sequence, if you haven’t already seen it. We’ve also got some resources online, and that is both for science and for cross-curriculum resources. And there is a glossary of science terms in the curriculum that you might want to access as well.

So I talked about our curriculum being organised in terms of strands and sub-strands. So we have two strands – Science Understanding and Science Inquiry Skills. And often they are just abbreviated as SU and SIS. So we talk about Understanding, which has five sub-strands. So we have our science as a human endeavour, our biological sciences, chemical sciences, earth and space sciences and the physical sciences. And then we have the Science Inquiry Skills. So again, five sets there. Questioning and predicting, planning and conducting, recording and processing, analysing and processing, and communicating. So right through the curriculum from Foundation through to 10, those are the strands and sub-strands that form the basis of the science curriculum.

We talk about the curriculum as being a continuum, so right from Foundation through to Year 10, there is actually a progression of learning, so students don’t come into Year 7 – this is primarily a secondary webinar – they don’t come into Year 7 knowing nothing. There is actually a curriculum that underpins 7-10. So there is an F-10 curriculum. And you can see on this – this is the navigation page. So you can actually do different sorts of filters. So you can actually filter – if you have a look at the top left, you can sort by levels, you can choose, particularly, levels 7 and 8. So this is what I meant by bands. So in science, as in all of the other subjects, apart from maths and English, they go by bands. So we’ve got two-year level bands at 7 and 8, and then one, you know... Sorry, a band at 7 and 8 and a band at 9 and 10, so we’ve conflated, in a sense, the different year levels. And that’s preceded by 5 and 6. And there is a 3 and 4. And it starts actually from level Foundation to 2. So you can filter. You can scroll across. I don’t know if you can see my... I don’t know if you can see my cursor there, but you can actually scroll backwards and forwards across the different levels. And going downwards, we’ve got the actual overview and then we have the content descriptions and we have the achievement standards under that. So it works horizontally, so that you can see the progression across the curriculum and you can scroll down to get the detail within a particular band level. So lots of options in that. You can also elect to see the level descriptions and the content descriptions and the achievement standards in your…all of those. And there are different...different filters that you can apply too. So, playing around with that, if you’re new to this, is actually very useful.

Generally, what you need to be looking at and you need to be able to distinguish between, but look at together, are the content descriptions and the achievement standard. So with our content descriptions, I’ve only shown you a section of this, so you can see we’ve got “communicating” at the top there. That’s the last of the sub-strands in the Science Inquiry Skills. So you can see that for each of the content descriptions, they have a code. I’ve highlighted that in red. I’ve circled that in red. So each of those, when you’re mapping, it’s actually useful to know what you’ve been teaching and then to map against a whole-school curriculum, which is necessary as well for curriculum leaders. And our achievement standards apply across two year levels, so that you need to ensure that across two years that your students have met those particular achievement standards.

How you report – and people have asked me about reporting – it’s actually a sectoral decision. So whether you’re with the government, the Catholic or the independent sector, they’ve got different guidelines about how they expect reporting to be undertaken, and then there’ll be some flexibility within the school system as well. So the questions about how you report is actually not the VCAA’s mandate, but we might be able to provide some advice about that, but certainly go back to your sectors for information about that.

The key...there is an underpinning key concept that is built into the curriculum. So even though we have our structure based on the strands of Science Understanding – the physical, chemical, etc, sciences, and science as a human endeavour – there’s actually some scientific concepts that underpin all that. So no matter what you’re looking at, what level you’re looking at, all of these particular concepts are contained within a particular band level. So we talk about patterns, order and organisation. We talk about form and function, stability and change, scale and measurement, matter and energy, and systems. And some schools have actually started to think about their curriculum planning in terms of these particular concepts that underpin the curriculum and how they might explore those and base a curriculum based on that. So they might say, “OK, how do we look at patterns, order and organisation? Where does that occur in the science curriculum?” So, clearly, it occurs with things like classification in biology. You can look at patterns in terms of the periodic table in chemistry. So there are lots of places that you might think about where patterns occur. How you might want to deliver that at school is up to you. How you might want to talk to students about the underpinning concept is also up to your school to manage, for them to identify what they’re actually learning about and how it fits into an understanding of science in general.

OK, so we’ve been through the curriculum structure. As I said, the main points to get from that is that the things that you need to be really mindful of are the content descriptions and the achievement standards, because they are mandated.

So in terms of planning opportunities, what sort of planning opportunities are there? There is a tool that we have, and I’ve just got the resource there, the Curriculum Planning Resource. This is actually a whole-school planning document, because if you think about the whole curriculum and how it might be delivered, it’s really important that you plan as a school, that you say, “OK, who’s actually going to cover that?” So, for example, science at Year 7 and 8 talks about rocks and rock cycles and plate tectonics. It might be that actually that descriptor is not delivered in science. That might be actually delivered within a geography curriculum or it might be delivered within a STEM program or it might be delivered in some kind of unit structure or inquiry unit that you might develop at your school. So what the curriculum provides you with is, in fact, the building blocks for you being able to put a curriculum together in the way that you want and in the way that meets the needs of your students. So there are lots of ways that you can do it. But what you need to make sure that you do is that you cover the whole curriculum in your whole-school’s curriculum program – that each of the content descriptions and the achievement standards are covered somewhere by some kind of unit or course or subject that is offered to students.

And one common way for science to deliver curriculum content is through a STEM approach, where actually science actually works with technology, engineering, or technologies and maths, to develop a curriculum, and particularly an inquiry curriculum, because there are some commonalities there in terms of inquiry that we look at in science inquiry skills, and the design technologies also have some similarities. So there are synergies that occur within the curriculum and you can actually streamline what you teach by thinking about, “How can I deliver science? Is it best delivered as an individual science study? Or should it be combined in some way? Or should we have some kind of mixed-mode delivery?” That you offer some core science and then it might be that there are some options that combine, or some programs that combine different disciplines. So, for example, STEM.

Something that... I had a question about differentiating student learning, and there are a couple of questions about that and, “How do you do that?” and “Where do you go with that? What should you be providing for students?” So a really important thing, no matter how you plan curriculum, no matter what you teach, is that you really need to know what your students already know before you can start teaching them anything. Where are your students on a learning continuum? And I’ve talked about the science curriculum as being a continuum from Foundation to Year 10. How do you know where your students are? So if you had, for example, 23 students in your class that you might want to say, “Well, OK, where are they on a learning continuum?” And of course, if you imagine... Let’s just take that you’ve got a Year 9 and 10 class, for example, and you spread your students based on where they are situated, you’ll find that you’ll have some students that are really almost beyond what you’re doing with them, that they’ve probably mastered all those concepts and they’re probably ready for Unit 1 VCE, for example. You might find that there are other students that are actually still down operating at the level 7 and 8. So you do need to know where your students are at before you can really begin to do anything. How you then deal with it is going to be up to you. So with those students that are operating at that 7 and 8 level, do you then provide them with supplementary, you know, materials? You obviously need to go...backtrack and work out, you know, where they haven’t mastered particular ideas. How you might do that is going to certainly be up to you. You’ve got the flexibility and the freedom to organise that in whatever way you want to. It might be sub-groups, it might be, you know... I guess with technology these days, you can, in a sense, have students working in groups at different levels, all working on different activities related to the same topic, depending on how you’re going or looking at the same skills, but working at different levels. So there are ways to actually structure that to support your students.

If you had ranked your students, say, on a topic of cells, and you’ve tested on cells, and you’ve got them all operating at different levels, the issue is going to be that students are not always going to necessarily operate at that level for everything else. So if you changed your topic to electricity or rocks, they might operate at a very different level. And if you then looked at their science skills, again, they may be different levels again. So the interesting thing is, how do you actually collate and combine students’ performance on the different aspects of science? Because we do have the standards. So we’re saying, “OK, by the end of Year 8 and by the end of Year 10, these are what we’re expecting students to be able to do.” And as I said, we’ve spread those out over a two-year period, and you can organise that however you want to. And your reporting is sectoral, it’s a sectoral decision, but you might want to say... Really, you can only assess what you’ve actually taught, so you can only assess that section of the course that you have taught. So if you’ve only taught cells at, say, a half-year mark in Year 7 and someone’s asking about assessing students every six months, in every six-month band, you’ve got to work out what you’ve actually taught them. And then you can really only pull out that relevant achievement standard and say, “Well, relative to that achievement standard, this is where they’re performing.” And you’ve got to think about how... If you have to make an overall judgment with taking into account biology, chemistry, physics, earth and space sciences, and the inquiry skills, that’s a very different matter as to how you’re going to do that. And that would probably be a discussion you’d need to have at a science faculty level. And it depends on what sort of reporting program that you’re using. But sometimes, you know, there are different ways that schools want you to report as well. What I think is useful in a reporting system is if you’ve got the comments section, that you can actually make specific comments about what different areas students have achieved a competency in, and or not a competency in, and where that can improve. So how you report really is a sectoral decision, and that’s actually a topic almost for a whole webinar on its own, as I found many of your questions were. But certainly I can take that up if you want to look at that a bit later – I’ve got my contact details at the end – that you can discuss that as well.

Just to give you an idea, because people wanted some ideas about how you might work out where students are at in a very generic way, so here is something that you could use at any level from 7-10. You can simply present students with some data and you can ask them, “OK, what would this experiment be about?” Because this type of activity, this type of, in a sense, a formative assessment-type task is going to let you know how students are going in terms of their graphing and their graphing abilities and their understanding of the representation of data. So because we have representation of data that goes right across from Foundation through to Year 10, and even into the VCE sciences, of course, you can actually use the same task to work out what level students might be at. So if you provide this... And you can go into your classes tomorrow and try this. Give them the data and say, “OK, I want you to draw it. I want you to label the graphs,” And just let them have a... You know, give them 15 minutes to have a go at sketching this. And you’ll find that you will pick up quite a lot of information about where students are at. What sorts of things can they do? Can they differentiate between continuous and discrete variables? Can they plot graphs? Can they scale their axes? Can they label their axes? Can they draw some sort of relationship? Can they look at a relationship between, in this case, distance and temperature? And then you can make this more complicated. I’ve suggested there you can actually insert an outlier, and then you can see, again, how students deal with outliers and you’ll find some very interesting results just doing that. So having some very simple generic-type tasks that you can... Or have very open questions – you know, “What do you know about how rocks are formed?” if you’re doing that sort of plate tectonics and rock cycle, etc. Having some very open questions is, again, going to enable you to gather where students are at in terms of their learning progress.

A thing that you’d need to remember once you’ve worked out where students are at is, and I think it’s really important, is this this concept of zone of proximal development – that essentially what Vygotsky determined was that you can’t really take a learner too far forward from where they’re at. So you need to work out where they’re at. And then it’s to say, “OK, the next stage. OK, what do they need to know next to be able to progress in their learning?” rather than thinking, “OK, they’ve got to get to this end point, and therefore I’ve got to teach them more about this end point.” You’ve got to... Every learner really has to be scaffolded. And this is a trick in teaching, because you’ve got 23 to 30 kids in a class. How do you work out where each is at? You need to spend... You need to allocate some time, some ways of grouping kids together who are on similar levels, for example, get them working in groups to progress them to the next stage that you might want them to have a look at. So, for students that can already do graphing, then you might introduce them to something like a logarithmic scale. They can look at more complex type of graphs. For students that don’t know how to label and scale, you could again, put them into a group and let them work with scaling and give them some exercises that are going to support them in terms of their learning and development there. And of course, you can have the whole peer support thing too, that, you know, your students can teach other students at, in a sense, a lower level. So there are lots of ways that you can go about addressing that. So different strategies in terms of supporting students to move through their zones of proximal development is to have someone there that is more experienced, whether that’s you, whether that’s another one in their peer group, whether it’s someone else, again, that you work with at school. It depends on how your school’s organised. So it’s that social interaction where students’ progress can be observed more clearly, I suppose, and then trying to scaffold, working out how to scaffold different activities for different groups and different abilities. And it does take time. But in the end, that’s how our kids are going to develop their skills, because we know coming into Year 11 and 12, their scientific skills are not necessarily as well developed as we’d like them to be.

So in terms of looking at it, someone asked me about, “How do you meaningfully scaffold inquiry skills across the curriculum?” The first thing I wanted to say was that for a curriculum, it is a continuum. And what we can see is that at every band level, we get a greater complexity of understanding of whether it’s a concept or a skill. So I’ve used this sub-strand of “analysing and evaluating”, and you can see in the early levels that what they’re doing is looking at... They are comparing observations and predictions, they’re looking at observations, predictions. And early on, F-2, they compare those with their peers. It then moves to looking at those predictions and suggesting possible reasons for what they’re seeing. And then they look at the notion of evidence in 5-6. So they come into Year 7 and 8, in theory, having mastered that – in theory. That’s what they should have been covering by the end of level 6. So they’re coming to you already having looked at data, already having made predictions and being able to think, “OK,” using evidence, understanding what evidence is in terms of data and primary evidence that they may gather – might be secondary in some kind – but they’re going to use that to develop an explanation. Then we start to, at 7 and 8, look at relationships, so that notion of relationships is what starts at secondary school – so, looking at relationships. And then rather than talking about explanations or findings, we actually use the word “conclusions”. So, looking at conclusions – what is a conclusion? And unpacking that. And when you move to 9 and 10, it’s then looking at relationships between variables. So if you looked at that previous graph that I showed you, for example, you might talk about the variables on the X and Y axis and say, “OK, what is the relationship between distance and temperature? What would that experiment have been about?” So thinking about, “What do the results actually mean?” And then identifying inconsistencies in data – sorry, I can’t see the end bit of... Oh, yes – that are consistent with evidence, so, again, looking at evidence. You can see there’s a progression that goes across F-10.

I’m just looking again. So what you also need to do, and what I’ve talked about, and I want to emphasise that the only mandated curriculum parts are the content descriptors and the achievement standards. You’ll see there’s a relationship between them. And what the curriculum states, and even the nation... This comes from the Australian Curriculum. It’s derived from that. What you need to do is look at the two of them together and you can see how they help each other. So, in the content description, what you teach is that you need to, for example, you need to look at using scientific knowledge and findings from investigations to identify relationships and then evaluate claims and draw conclusions. That’s what we want students to be able to do, and that’s what you should be teaching. What you then assess them on is that they can... Can they summarise data from different sources? Can they construct representations of the data? Do they describe patterns in relationships, and do they use them when they’re justifying their conclusions? You can see there’s a direct relationship between what you teach, through the content description, and what you assess, through the achievement standard.

And again, if you’re going to scaffold, and think about, “How do you meaningfully scaffold inquiry skills from 7 to 10?” you should be looking for the main words and the main ideas that you’re...in terms of what is intended to be taught. So if I was looking at this and thinking about, “OK, how do I start to scaffold ‘analysing and evaluating’ across the curriculum?” first of all, I’d be thinking about, “OK, 7 and 8, they’ll be looking at relationships.” And then at 9 and 10, they’d be advancing, because they’d be describing relationships between variables, so being, in a sense, a bit more precise about what that actually means, and then looking at drawing conclusions, using evidence. So teaching them... Whereas in 7 and 8, they simply draw conclusions, the progression to 9 and 10 is they draw conclusions, but using evidence and being consistent with the evidence. So if you’re thinking even about a progression between 7 and 8, and 9 and 10, you can see that students can often draw conclusions at 7 and 8, but not justified. They might not make any sense to...what they’ve been doing. So they’ve got to move from being able to draw conclusions that are, in a sense, relevant to what the question is. So there’s a progression there. And then they have to be able to think about drawing conclusions that are based on evidence. “What is valid evidence to use in supporting their claims?”

So, again, thinking about, “What are the main words that we’re using here?” and thinking, “How do I do that?” You don’t have to do that with every single subject within the curriculum. So you don’t always have to do the whole inquiry skills with every...you know, with biology and with chemistry and with physics, and with the earth and space sciences. You can choose in your curriculum planning to say, “I am going to focus on relationships and drawing conclusions in...” It might be in physics and chemistry, for example, depending on what your context is for teaching. So think about the curriculum as a whole, that bricks idea, the bricks building, you know, being able to provide buildings. So, how do you put them together? What are you going to teach where? What makes sense to teach where? So, what skill links with particular science knowledge? And also, don’t forget, and it is a thing that’s easily forgotten in curriculum, is the “science of human endeavour”. That really gives a context to why they’re learning about this stuff. So if they’re learning about, you know, chemicals or the periodic table, why are they doing that? Why is that important for them to do? So, go back to the “science of human endeavour” and try and make some links there.

OK, so going into assessment. So, assessment needs to be done. So, students should be assessed against the achievement standards, and they typically describe what students should be able to understand and do, and they would form the basis of your reporting system. So always start with the achievement standard when you’re thinking about assessment. It’s the measurement of how well a student has demonstrated the application of knowledge, skills and understandings. So that – you need to make some sort of comment about that when you’re doing your assessment. It should be part of your normal teaching and learning. The point of assessment is it should improve student learning, and certainly the importance of formative assessment is huge there, that it’s not just a summative thing. You can actually use assessment to let students know where they can improve. It must definitely align to the curriculum. So there’s no point in assessing things that are outside the curriculum. So what we find is that if you try and map your favourite thing that you’re teaching, make sure it does map actually to the content descriptions, and it’s not beyond that. It should be authentic with real world challenges and provides feedback to students, ideally, is what assessment should do. And that applies right across to VCE as well.

So thinking about it as being part of your teaching and learning program, what is it that a student’s going to learn? How are you going to then teach and support students to learn that? And how well has the student learnt the specific content, as well as...

I need to reduce my screen. Sorry. I’m not seeing the bottom bits.

Yeah, so those factors you need to take into account in terms of assessment.

So when you’re thinking about assessment, I’d suggest that you start with the achievement standard. What is it that you’re going to assess? So if you have a look at the achievement standard... I’ve taken the example of “Explain how different factors influence the rate of reactions” This is from the Year 10 chemical sciences curriculum. You then say, “OK, what’s the relevant content description that gives me a bit more unpacking of that?” So it gives you a bit more information here – that different types of reactions are used to produce a range of products, and occur at different rates. So that’s what you need to look at. Different things that, you know... What examples can I use in my teaching that “produce a range of products and can occur at different rates”, and “chemical reactions can be represented by balanced chemical equations”? So, OK, what’s going to lend itself to doing that? So an activity might be that you’ve decided that you’d like to investigate rates through the use of different enzymes and how they might affect the digestion rates of different foods. So you might use an amylase or a protease to see...and to compare how digestion’s affected. And then, of course, you might think, “Well, when you’re developing a unit, if I’m going to do that, is it just chemistry? Or can I link it to something else?” You might link it to energy. You might link it to biology, because you might be also doing digestion at the same time. So thinking about, “What am I doing as the whole curriculum?” This is why whole-curriculum planning is important. You can actually conflate things and make it easier to teach.

So we’ve got, in terms of demonstrating achievement – and I think what science teachers tend to do is they focus on achievement in terms of what students can write. But try and be a bit... And given that, you know, we’re talking about 21st-century skills, I think it’s really important that you think also about, “What can students do, what can they say, what can they make that is going to demonstrate that achievement?” And I think that variety actually is going to, as well as be engaging, it’s going to enable you to test a wider variety of skills.

We’re also got indicative progress, so this is... A couple of you asked that question about, “How do we assess between, and what does progress and achievement look like between achievement standards?” So you can have a look at... We’ve actually got some templates that enable you to have a look at and to think about indicative progress.

I don’t know why I can’t move my slides down... I don’t know if I can be helped with that.

OK, so they are particularly useful when you are thinking about progress in between standards, and given that we have two-year bands, it’s really important that you think about that intermediary-type progress.

So we’ve already got on our website, and I think I had the... Alicia, thank you, Alicia. She’s put up the templates there.

So we’ve got an indicative progress template that you can use at any level. And what we’ve also done there is that we’ve given you an example. So there is an example that I’ve just picked out from that that looks at predicting and analysing effects of unbalanced forces. So, that’s the Level 8 standard. You always look at, “What standard have I come from?” – and that is from the Year 8 level standard – to 10 – “Where am I going to?” So you’re thinking about what happens before and then beyond, and then thinking about what the middle bits are. What is it that students are able to do? And sometimes that phrase, “They can do this, but they’re not yet able to do something else,” is what you can use in terms of that reporting and working out how you report on students between, you know, between standards, if you want to report that way. Because, technically, what we report against is simply the standard. Have they met the standard or have they not met the standard? If you need to report differently and differentiate, for example, every six months, then you’d have to have a different reporting system set up and that would depend on your school. So, again, having those conversations at a faculty level – “How are we going to report? Is this useful for you to assist you in reporting by using these indicative progress templates?”

I’ve also put in an example there of inquiry, so using the template to also scaffold inquiry. “How do you...” You know, “What are the things that kids can do but not yet able to do, that puts them in between?” So thinking again... Great faculty discussions – “What would we be expecting every six months? What are we... ? How are we going to teach to that? And can our students meet it?” So what you’re almost going to be setting up are almost your mini-standards – is one approach to doing it. Set up your scaffolded developmental levels of, “This is what I’d expect my students to do initially if they’re looking at representations of data. This is what I would expect they can then do next. This is what follows.” And just progress it that way. And you can develop, therefore, assessment based on that.

I’ve got an example here of, you know, just a context where a teacher’s just thought, “OK, let’s just have a context of separating.” So this is separating mixtures in Year 7 and 8. So, again, this is how you might think about differentiating learning. And I had a lot of questions about differentiating learning. That would be certainly a great webinar to take on its own. But here is one that is very open. So you provide students with a generic challenge. They can work in groups. You might want to change groups at different points because kids will be at different levels. So you might want to have students that do want to go on and look at more complex separating techniques. You might have others that still physically might not be able to handle even perhaps filtering or using magnetism or whatever. So as students progress and as they start to get into... get engaged with these processes again, you can think about, “How do I differentiate the learning? How do I group them? How do I support them? How do students support each other? What do you expect there?” And I think also then tying up to the personal and social learning and other capabilities also is very helpful. But there’s one with the separating machine, and then looking at how you might scaffold it. So... And using those templates, there is an example.

I don’t know what I’ve done here. I can’t even see what I’ve got. Sorry. Oh, no, no, I know what I’m doing. Sorry.

OK, so what I’ve got there also are the stimulus questions. So here is again where you can differentiate some learning, so you can actually structure questions, especially if you start to see how your students are performing with a particular task, you can see where they need the support. So sometimes these questions help streamline their focus for where they need to be... where they need to be supported. So think about setting something generic and then having different groups be able to undertake different questions. It might be that they have to, you know, almost have entry-level questions, see how they respond, and then see what level they can go to next. But there is certainly no issue with students going in greater depth. And people talked about differentiating – do you go to a next level or do you go to greater depth? And I think that greater depth is the way that actually builds scientific understanding of concepts rather than, you know, having a Year 7 kid do a VCE course. I think there is great scope for depth rather than moving on to the next level. But that’s certainly up to you and your school.

And this is a template that was used in terms of the indicative progress there. So, again, look at what the standard was before they came into the class to do separating techniques and then have a look at what’s expected at the end of the level, and then stage it through, because, as I said, we talk about this as being a learning continuum.

We’ve got a few resources to support you, and certainly there’s... We haven’t got many for science at the moment, but this year we’re developing resources for each of the disciplines. So please check, probably later on in term two, that section on “Help me find a teaching resource”. And we’ve got all sorts of inquiry units being developed. So there’s one on nuclear radiation, the effects of that – so looking at picking up on the isotopes and the radioactivity from chemistry. There are things on, you know, “Are space aliens real?” That sort of thing. Got some separating techniques as well. So there are... So keep your eye out on that. There’s certainly a lot coming up.

There are some curriculum planning templates. This is where the codes come in. So the codes are useful here for mapping. Rather than running out the whole achievement standard, you can make sure that you’ve covered the whole curriculum. And that’s, again, a whole-school planning feature.

There is a numeracy continuum. I’ve got the link there. So we’ve scaffolded...where we’re expecting numeracy to occur. So linking in with the maths curriculum. We’ve shown you the examples of where each of the maths-type skills can be applied in the sciences, and that goes through from 7 to 8, and 9 to 10. They’re just some examples of the sorts of things that we’ve specified. So we’re expecting students to, for example, be familiar with SI units and to do unit conversions.

There is also a career education framework and resources. So there are six learning resources. I’ve just got a screenshot there of the particular content descriptions that are relevant to those particular resources. So you can have a look at those. And really, it’s just about how probably even your existing resources can be adapted to include a career focus. So I think that’s important in terms of showing students where you can go in a science career, because often they don’t know.

We’ve had a project on formative assessment, so there is a very extensive formative assessment resource that gives you guidance as to how to create your own assessment rubrics, formative assessment rubrics, and some examples of ones that have already been done that apply to science.

There’s a bushfire education resource. And there are four units at levels 7-10 that are linked to those particular aspects of bushfires – so learning about them, preparing, responding and recovering from bushfires. Again, have a look at those.

We did some webinars last year about Aboriginal perspectives in the F-10 curriculum, so you can have a look at those areas. There are some secondary STEM examples that might be of interest to you.

And I’m very happy to take questions.

This is actually a really common problem, Jared. Thanks for your question. It’s about Year 10, specifically. This applies in some schools, even to Year 9, and in others, Year 8 as well, that science is offered as an elective. So what happens is that students do not get access to the whole curriculum. This is... I think it is a problem because the curriculum is an entitlement for all students and also what’s happening is that because we’re seeing curriculum as being a continuum from F-12, we’re now going to assume that when we redevelop our 11 and 12 courses that students have actually covered the relevant content that’s in F-10, so that if you’re going to enter VCE chemistry or biology or physics or whatever, that you’ve done the relevant...that you have completed the relevant sections from the curriculum F-10, or especially the 9 and 10 band. So if students haven’t had access to that because your school offers options, then prior to undertaking VCE, you’d almost have to do, like, a bridging course that covers the major concepts, because we are actually expecting that students are exposed to that whole curriculum. And I understand that there are questions about a crowded curriculum and how you put it together. But this is where school discussions are really important, that you think about, “OK, here’s the whole curriculum. How do we deliver it so that students, at least, you know, are exposed to it?” And what you might think about is rejigging it so that students get basic information about the whole curriculum as it’s presented, and that maybe your options become extensions or things that aren’t necessarily in the curriculum, or that are more innovative and that go a bit deeper. So thinking about at least that students know what a force is, or know what acceleration means, or know what a cell is, or know what a respiratory system is, or know how the rock cycle works. They’ve got to know those basics, so schools will need to probably start to rethink about how their curriculum is structured, because there is an entitlement of the whole curriculum. Jared, I hope that answers your question. I hope it doesn’t scare you too much. How you put them together, though, and I’m just looking at your elective, for example, called Environment, Earth and Space. So there’s quite a few different aspects of the Science Understanding strand that would be kind of meshed there. And that’s totally fine. But that... We’d say that rather than it being elective, it really should be accessible to all students and that maybe what you should do is think about pulling out what essential elements of that elective all students should be entitled to, and then running the rest of that part as an extension elective and having something like that working. I don’t know if that would work for your school, Jared.

**Katerina Poropat:** OK, so nothing else has come through the Q&A box, so we’ll just bring the session to a close now. And if anyone has any questions that do pop up at a later stage, Maria’s details are up on the screen there, as well as the generic email address for the F-10 unit. So please feel free, if anything comes up at a later stage, to get in touch with us, and we’ll help address those queries. But thank you all for attending and we hope that you enjoy the rest of your afternoon. Goodbye, now.

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