

LIFE SCIENCES with Mariechen Vermeulen -Transcript

[00:00:00] **George Eadie:** [00:00:00] Since 1975 The Answer Series, often called TAS, has been empowering high school learners. We've become the best-selling study guide series in South Africa.

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[00:00:25] Our purpose with The Answer Series is to impart the gift of confidence. Welcome to Subject Scoop, with me your host and TAS CEO, George Eadie. In each episode of Subject Scoop, we dig into a specific subject area and what the year holds for that subject. We'll unpack what learners are really struggling with and how you as a teacher can help them on a practical level.

[00:00:49] It will also cover what subject experts experienced in Gr 12 exam marking. Okay.

[00:01:00] [00:01:00] This episode, we tackle life sciences and joining me to do so is Mariechen Vermeulen. Mariechen is the head of department at La Rochelle girls high school. In Paarl. She's also involved in the external marketing for the matric examinations. Now for several years in 2012, she graduated the human life sciences department of Stellenbosch Cum Laude. And so we are extremely grateful to have her here today to unpack what's in store for life sciences in 2021.

[00:01:29] Welcome Mariechen. It's absolutely awesome to have you here today to unpack Life Sciences in 2021, but first, a little bit more about yourself and kind of what attracted you to the subject. You know, why Life Sciences, what aspects of the subject attracted you to it? Why did you want to teach it to others?

[00:01:47] **Mariechen Vermeulen :** [00:01:47] Well, George firstly, I think, um, as with probably many teachers, I had a teacher inspired me and I was the snot on archaea. Absolutely fantastic biology teacher. She didn't only teach me the content, [00:02:00] but showed me so much about compassion and empathy in education. Um, she was just amazing.

[00:02:05] It was almost my favorite subject of the day. She taught me that the most valuable things in life are very often, also the most helpless ones. So we need to people to protect it. And life sciences gives me the opportunity to express that love of nature and my drive to protect it. And then secondly, I'm definitely a left person.

[00:02:23] Um, so the scientific thinking that accompanies life sciences really appeals to me. It just all makes sense. It's methodical, it's organized. Um, it's a subject of processes that linked together and the more you study it, the more your understanding of the whole picture of life just, you know, fits together, which links to my last reason.

[00:02:43] And that's that, you know, I just love nature and understanding organisms better. And I think this part of Life Sciences appeals to most learners as well, because like integrating learner first period in my class will ask like, men. What are we going to dissect this year? So,

you know, just like the blood and [00:03:00] guts of it all and understanding how things work that appeals to me.

[00:03:03] **George Eadie:** [00:03:03] That's definitely something I can connect to as well. The love of nature. Although I do recall our biology teacher in school dissecting a sheep's brain, and I remember being quite grateful for not being the best that episode. So, um, there you go. But. Mariechen, how has Life Science has changed over the years? What issues have emerged or are there any positive changes that have occurred in the subject as you've been teaching at these last several years?

[00:03:31] **Mariechen Vermeulen :** [00:03:31] Well, the subject has definitely undergone some changes back in 2007. When I was in matric, I don't remember the subject having such a strong like practical angle. Um, and to me that would be the most dramatic shift, you know, changing from biology to life sciences. Where the emphasis now seems to be on the science component and the skills that accompany scientific thinking.

[00:03:55] Um, this is definitely led to a greater emphasis on higher cognitive [00:04:00] thinking skills, especially when answering exam questions, um, skills such as being able to explain why a particular adaptation is important rather than just naming or listing it. And, you know, in my experience, the shift wasn't necessarily a bad thing.

[00:04:13] Um, I actually prefer teaching the subject in this new direction, but, um, I think the sad thing is that for many learners who love biology in grade nine, because they think it's all about organs and systems. They're very quickly disillusioned in grade10 when the subject takes on this new layer of complexity. So it's almost as if the shift from biology to life, sciences has to some extent limited the accessibility of the subject content to your average student.

[00:04:40] **George Eadie:** [00:04:40] And what are some of the ways you kind of onboard those learners into the scientific component of it? You've learned to really love that component. And perhaps it's true that others who are experiencing it for the first time, um, have, have yet to learn it. And so you have yet to love it, you know, [00:05:00] but they can get there. What are some ways that you help them to get over that threshold?

[00:05:04] **Mariechen Vermeulen :** [00:05:04] So I believe in practicing life sciences, the same way you would do mathematics. So the more you do examples of questions, the more you actually have that type of questioning in class, where instead of just teaching the content, you actually engage the learners and ask them. But why? Try to explain to me why this is important and then definitely starting early on. Like I make a point of taking a lot of time in the grade eight curriculum to do the scientific method with them and to take them step by step through how do I write a hypothesis with like many examples, because the more opportunity they get to practice that skill, the better they become at it.

[00:05:41] **George Eadie:** [00:05:41] Yeah. And I suppose it would be possible to point to some of the wonders of science and scientific developments over the years that have been brought to bear on our world. Um, You're a specialist in your subject and have experienced marking the papers. I mean, that's part of what I think it all comes down to in the end.

[00:06:00] Um, What are some common themes or issues that came up in the marking related to Life Sciences? Just, just of late.

[00:06:06] **Mariechen Vermeulen** : [00:06:06] Okay. So definitely reading skills, um, just learners, misreading questions, not taking enough time to ensure that they actually understand what the question expects of them, or even how many marks worth of information they should be writing.

[00:06:18] Um, so taking time to read. Learners really need to be educated on differences between verbs, like explain and list, discuss and name because each of these requires completely different things. And in the last couple of years, the explain questions have really become an integral part of the NEC Life Sciences exam.

[00:06:37] For example, a typical question could be, explain the consequence of the eustachian tube becoming blocked by mucus to which many learners will respond by actually stating the function of eustachian tube in regulating pressure in the middle ear. When the question was actually asking them to consider what would happen if the eustachian tube could not perform this function.

[00:06:57] So, you know, practicing that deductive [00:07:00] reasoning is very important and should really be started as early as possible. Like I mentioned, grade eight level already so that they get enough time to acquire that skill. And then other common issues we pick up, um, or that there's definitely certain content that teaches clearly spend less time on, um, because learner performance in these topics is always sub-par. Topics like plant hormones, how the year functions, homeostasis, evolution, whether it's because of time constraints or because the teacher isn't confident in the material is uncertain, but that's definitely something we've picked up as well.

[00:07:32] **George Eadie**: [00:07:32] Super helpful for teachers heading into their strategies for 2021 and how to up weight some of those areas that are common, um, sort of must mark areas. So thank you for sharing that. Um, and just in terms of teaching the subject, what do you find are some of the biggest challenges that you face in teaching life sciences?

[00:07:53] **Mariechen Vermeulen** : [00:07:53] So I think this might be true for many subjects, but for me, time is definitely a big challenge in Life Sciences. You [00:08:00] know, finding enough time to do the content justice. Our curriculum is really jam packed. Um, just because of the nature of the subject. I mean, how do you fit life into 200 school days? Uh, not to mention all the time that goes into other activities in school and takes away from those precious 200 days.

[00:08:16] So you often find yourself having to skip parts of the content that seem a little bit less important in order to get to the meat of that information. And it's really sad because I think life sciences is one of those few subjects that really teaches a kid about real life and real life skills. So you don't want to really skim on that information.

[00:08:35] Uh, another challenge that many schools are facing is the practical component of the subject. Um, being more practical and applied, you would ideally like to actually show learners the experiments that do discussing and have them do them in class. But for many schools, they just don't have the apparatus or the funds to purchase them.

[00:08:52] So that kind of detracts from the real value of the subject. And then definitely for me, I've a particular challenge with a disconnect between [00:09:00] the progression from grade eight to grade nine, moving, integrating learners on not adequately prepared in grade

eight and nine for what they can expect in grade 10, not in terms of content, not in terms of assessments and not in terms of volume of work.

[00:09:13] Um, the senior phase. It just doesn't teach kids how to deal with loads and loads of work. I mean, in some subjects they still write off content in the June exam. So by the end of the year, they're not even writing on the biology component of Natural Sciences and it's a huge shock to their system at the first term of grade 10.

[00:09:32] So I think this could definitely be better mediated by just reevaluating the way we teach natural sciences and how the assessments in those grades are compiled.

[00:09:40] **George Eadie:** [00:09:40] In terms of overcoming some of these challenges. And addressing them in, in, in the, in the classroom, have you found certain resources to be super helpful that you wouldn't mind sharing?

[00:09:51] Um, with the teachers that are out there, um, facing the year ahead and what might be some things to put in place to make their jobs a little easier?

[00:10:00] [00:10:00] **Mariechen Vermeulen :** [00:10:00] Okay. So I'm definitely an avid textbook collector. You know, no textbook is enough for me. I love combining resources and I'm constantly looking for new and interesting diagrams and explanations to help learners better understand the content and the answer series has been one of my favorites to use. Um, the content is just so learner friendly, the great diagrams and the summaries make it easy for them to understand. Um, it's really a trustworthy source and it's designed specifically for the South African curriculum.

[00:10:28] So, definitely one of my favorites and then my learners and I, we love YouTube videos, um, like their amoeba sister's crash course biology that they really helped. You summarize the most salient points with great visual animations that keeps your learners interested. And then for me, I love also using the NEC exam database. Um, it has a wealth of resources when it comes to setting up tasks and tastes and just being able. To kind of study the trend of what they asking in the end of the year exams and the diagnostic reports that then come out after those NEC [00:11:00] results just adds another layer of complexity by dissecting those papers and giving very useful feedback about common areas that learners have been making and giving teachers good advice about how to address them.

[00:11:13] **George Eadie:** [00:11:13] Thank you so much for sharing that. I think that's going to be of great use to teachers heading out into 2021. But just over to a quick ad break. Now, as we just share some of the things available to teachers supplied from the answer series back in a second.

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All right.

[00:12:05] **George Eadie:** [00:12:05] We're back. I'd love to get into now the impact of COVID-19 on your subject. Clearly the whole world has been impacted by this, but education has suffered a, a deep blow let's say, um, what has been the unique impact on Life Sciences and, and, and how is that impacting how you're going into 2021.

[00:12:26] **Mariechen Vermeulen :** [00:12:26] So for me, definitely COVID once again, may time a big factor. Um, you know, it's already a jam packed curriculum to get through in a normal year, especially with the grade 12 curriculum sometimes also including grade 11 content, but with COVID, you know, we felt that time crunch even more. Um, also due to social distancing measures, we were very limited in performing more practical components in class.

[00:12:51] Um, we had to go back to doing demonstrations rather than letting learners handle the apparatus themselves as we would normally do. But they were definitely some positives for me as [00:13:00] well. You know, it wasn't all bad. Um, COVID did force us to think about learner support systems at home. You didn't see them each week.

[00:13:07] You had to give them that distance learning support in some way. So we developed e- lessons and some online quizzes. We started exploring all different types of apps to help with distance learning. And all of those resources are still there. Now, you know, we can use them over and over every single year. So they stand to benefit so many learners and it's actually just made my life so much easier. Um, they can serve as that invaluable resource for learners who are struggling, but also learners who want to do that extra bit to get good results. And then I also really enjoyed the emphasis that COVID put on the theory and the understanding of the work I'm spending more time on getting the important bits down, laying that foundation.

[00:13:48] Well, because. That was really all we had time for, you know. They took the fluff out of the curriculum, so we could focus on the important parts that were essential for the higher grades. So pros and cons.

[00:14:00] **George Eadie:** [00:14:00] [00:14:00] Out of curiosity, now that you mentioned they took the fluff out of the curriculum. What, uh, this year's grade 12 is going to be writing in terms of the curriculum. Are they going to need to be doing, um, you know, additional catch up or what's the impact of that?

[00:14:14] **Mariechen Vermeulen :** [00:14:14] So the fluff year would be like maybe at the end of a chapter on digestion, they would take out little contents about, you know, healthy diets, for example.

[00:14:24] So in terms of what they took out of the grade 11 content. It doesn't have that big, an impact on the grade 12 curriculum as we're teaching it now. Yes, there would be

some key things that we would have loved to explain to them just for like life skills purposes, but there is no, there was quite a good connect between what needs to be done for the next grade. So we don't leave that content out.

[00:14:47] **George Eadie:** [00:14:47] So turning nine to 2021, w what is your outlook for the subject and perhaps what are some of your concerns?

[00:14:52] **Mariechen Vermeulen :** [00:14:52] I really want to ensure that, you know, despite all the uncertainties and gaps that 2020 created and kind of has left us with [00:15:00] that, I still focus on laying that good and solid foundation for my learners to be successful in life sciences. I think that's vital, you know, to never lose focus of that bigger picture way. We want our learners to get you. So every activity you do, every homework exercise. Every presentation, we do it hones the skills that you're looking to cultivate in them, critical thinking skills.

[00:15:22] And that way of learning actually starts very early on. So I put a lot of pressure on my grade 10's. Um, sometimes, maybe a bit to my own detriment because you know, that's the first year you can really roll up your sleeves and start doing Life Sciences with them. And I do this because I know where I need them to get you.

[00:15:39] I know where they need to be in grade 11 and grade 12, where I'm not going to be their examiner. So I'm going to keep that standard number one. And then at the same time, I think this year, I really want to focus on mental health for my learners. Um, last year just took so much out of many of us. Um, the learners are no exception to that.

[00:15:57] As teachers, we were just constantly trying to [00:16:00] keep it all together, maintain a level of normality. And for me, that was really a huge struggle, um, doing things two, three times over. Planning meticulously and then having that rug pulled out from under you. So hashtag teacher problems, 2020, you know, so, you know, learners pick up on that and they're also really stressed and they're anxious about getting through the work and getting good marks or that they lives can go on.

[00:16:22] So this year I want to slow down. I want to take some time to pause. I want to do what I have to do and not put too much pressure on myself or my learners, everything that I want to do. Because we need to, I need to get a bit of balance. I don't want learners sinking under the work. I don't want them feeling like they're being left behind.

[00:16:43] I don't want them to struggle, but be too afraid to ask for help. So for me this year has to be a mental health year.

[00:16:50] **George Eadie:** [00:16:50] I'm really pleased that you mentioned that because I'm sure that's going to give a lot of teachers out there, the confidence to do the same, because I'm sure the pressure is on to sort of feel well [00:17:00] I need to tick the boxes, you know, um, and actually ticking all the boxes could end up being at the detriment to the learner and, and, and yourself as a, as a teacher looking to do, you know, many more years of, of, uh, of passionate teaching. So I think that is Sage, uh, consideration for 2021. And, and with that, are there some strategies and mechanisms that you've put in place to make the most of this year for your learners?

[00:17:28] **Mariechen Vermeulen** : [00:17:28] Well, at our school, we've switched to an online platform of Microsoft teams. So I'm in the process of compiling a database of my exercises, my notes, all my online quizzes and video lessons. Um, and this way I can also actually keep the communication lines between my learners and myself open and check up on their progress.

[00:17:47] There've also been some major changes to the number of formal assessments and the prescriptions around these four this year, specifically. So that's kind of forced me to have to rethink about how I'm going to use informal assessment in a more meaningful [00:18:00] way to cover my content. So I'm a big believer in practicing life sciences.

[00:18:04] And I tend to have a look at my old exercises, homework activities. You know, just reorganize them, bulk them up a bit so that they really taste the wide range of skills and topics and can help my learners see what they do and do not understand.

[00:18:18] **George Eadie**: [00:18:18] Okay, great. Yeah, that's gonna, I think leave those learners in a very solid place. Um, one of the things that we really are interested in always is, you know, what is this role of the subject in this learner's life beyond school? Uh, the future careers they might pursue or just. What is the general application and lasting impact of, of covering the subject in high school? As a deeper meaning aspect.

[00:18:42] **Mariechen Vermeulen** : [00:18:42] So I really love the subject, um, because I believe it's one of the few things that actually teaches you something about life. Um, you just have to look at how people are responding to the ideas of like herd immunity and viral infections to know who actually took Life-sciences at school and who knows what they're talking about and [00:19:00] who doesn't.

[00:19:01] So for me, the subject teaches invaluable life skills, um, that everyone needs. And it can come in handy in many future careers. Um, learning how to work with dots are learning how to question and think scientifically learning, how to identify links between topics and seeing that bigger picture. And these are about a few of the skills that our learners hopefully pick up when they go through life sciences.

[00:19:24] But at the same time, I've experienced it to be a undervalued subject. Um, many courses in the sciences require Mathematics and Physical Sciences, but not Life Sciences. You can go study veterinary science and even medicine at certain universities, and they don't require Life Sciences. And I feel that it doesn't get the credit it's really do. Seeing that the emphasis has shifted to be a more scientifically orientated subject. It should really, in my opinion, be more valued and undergraduate programs for science.

[00:19:56] **George Eadie**: [00:19:56] I couldn't agree more. And particularly with [00:20:00] the way in which the world is turning now that we need to have a much greater consciousness of the national environment in the way we conduct everything. Um, so I really stand with you on that. You've been absolutely awesome today. I've got one more question for you then, please. What advice do you have for learners that want to succeed at Life Sciences? You know, any study habits or skills that they should try to cultivate to fulfill their potential in the subject.

[00:20:28] **Mariechen Vermeulen** : [00:20:28] So being a choice, the subject, they definitely, number one at least need to have an interest in life sciences, you know, preferably a passion,

but at the least an interest. And then it's definitely critical. Um, and scientific thinking skills are important, you know, questioning things, looking for mistakes improvements, wanting to understand, but why, how does it work? Having that inquisitive nature? A good work ethic is also very important because there is so much content to this subject. You need to, to work at it every [00:21:00] day. Long-term learning is, would give you a learner, the greatest success in the subject, and it's allows you to spend enough time with the content so that you can actually start seeing the links between the concepts.

[00:21:10] But nothing's going to work, at least you do. So there needs to be a dedication to learning. And with that, you also need to learn from your mistakes. That's a scientific thinking, you know, they say if at first you fail, redo it at least two more times, because then your failure will be statistically significant.

[00:21:25] So that has to be the attitude of the last science is learner failure is not an end. It's the beginning. And then to some degree you have to have a love of languages that also helps because the subject is full to the brim with like terminology and jargon. So. The way I often help learners to better understand the content is to unpack those words for them to tell them where they come from, what they mean. And if you're a really good learner, you're actually studying that for yourself.

[00:21:50] **George Eadie:** [00:21:50] Well, by now, I think any teachers listening and any learners listening have some serious practical advice to take into 2021. [00:22:00] But if I think back to what we've talked about today, the things that really stand out for me are that. This is a science and the evolution in life sciences since the days of being biology has been to cultivate that scientific rigor that comes with the subject. And to also have that as a component, as a source of inspiration, I mean, science has brought so many wonders to the world and it's something that can bring relevance to that learner and to the teacher, um, you know, growing through the subject.

[00:22:30] The other part that stood out for me is just that there is a serious amount of volume to cover. And the impact of that is the requirement of consistency, but also the content aspect, which is not to try to call the boxes to still maintain that sense of calm and balance to get through the a in one piece.

[00:22:49] So as to be able to convert on the exams at the end of the year, in a way that yeah, reflect a sense of grounded knowledge and. And lastly to [00:23:00] cultivate that internal sense of, but why, and you know, that that can last well beyond school, you know? And, um, there's no depth and no, no end to the depth of, of nature.

[00:23:12] Um, so I'm sure there's, you can ask the why so many times and, and keep the inspiration and curiosity flowing all around us. You just need to ask why. And again, thank you so much for being with us today. We really appreciate your contribution and look forward to checking in with you throughout the year for any teachers out there. Um, or anyone in, in any case, looking for any more information or questions, please feel free to reach out. We'd love to support you and, uh, be in touch as we collectively tackle this very important subject.

[00:23:43] We're so glad that you took some time to listen to this episode of Subject Scoop.

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