Andrea: Good evening, everybody, and welcome. We're in sunshine cuz we've now moved around to spring. Which is pleasant to know. This is the fourth online Assessment for Learning Course. And we are pleased to welcome Dylan and Chris again with us this evening, who are looking forward to answering your questions.

So thank you very much to the National STEM Learning Center for again hosting this course and opportunity for our experts to get together. Without further ado, we will crack on. So thank you very much to every to all of you who've submitted your questions. That we have so many that we've picked out some and hopefully the answers we will give will be relevant to lots of people who submitted questions as well.

So we gonna start - we've grouped our questions as normal. The first group of questions are all about planning and learning intentions. The first question we've got, I'm gonna ask Dylan to reply to which is from Sally Valentine. And Sally asks what do you feel the time split should be between planning and marking on a daily basis to be the most effective assessment for learning.

So, up to you Dylan.

Dylan: Thank you Andrea. I think the first thing to say is it's always gotta be a focus on what way of spending a teachers time is gonna have the biggest impact on student achievement. So for me that's always the important starting point, what things can I be doing that's gonna have the biggest impact on student achievement.

But to be more precise in terms of the specific question it's my experience that teachers in the UK and indeed in most of the world. Spend about twice as much time marking as they do planning. And I think it would be quite useful to reverse those proportions. So in general, I think spending about twice as much time planning and about half as much time marking.

I think it would be a reasonable compromise. But again, sometimes you need to spend more time marking because it's going to have a big impact on student achievement. By and large, I think Paul Black and I probably made a mistake in our early work on formative assessments, by focusing on comment only marking.

Because we think now the most important formative assessment doesn't happen when the teacher marks student's books. It happens when the teacher plans the lesson with a view to getting information from the students about how the learning's progressing when the students are with you and that requires careful planning.

Andrea: Okay, thank you Dylan. That's a really helpful answer. Chris, don't you want to add anything to that?

Chris: I totally agree with what Dylan said. Teachers, even beginning teachers, who spent a lot of time on planning don't really focus that planning enough. So given themselves more time to plan

where they can come up with good questions that really help find out what sort of thinking.

Or designing tweaking activities so that they can understand the children's thinking as the children are doing the activities are good ways to spend your time. Much better really than looking after a student's completed the piece of work and giving feedback at that point. It's really what's the most productive feedback loop.

That's what you should go for. Occasionally it will be feedback on written work, more often it's the sorts of feedback that happen within the dialogic classroom.

Andrea: Right thank you Dylan for that. Thank you Sally for that question I'm sure lots of people will find those responses really helpful.

So moving onto the next questions, Chris I've allocated both of these to you because they're both about earlier years, but Dylan please feel free to interject as well. So, our first question is from Bushra Khan, and Bushra asks, in early years, giving a constructive comment in formative assessment is a bit tricky.

Have you got any advice about strategies that they could draw I don't want you to deal with these issues first.

Chris: Well I think when earlier teachers write comments from students work that comment is not just for the child. It's for the adult who will be interacting with that child.

So earlier teachers are very good at bringing together both the continuous summative assessments and a formative assessment that was needed in the classroom. But in terms of the type of comment I think that those ones I've seen are ones that encourage the students to look at what the teacher is valuing within the class.

So one of the teachers we worked with in Wales on one of the projects. She had every week she'd sit down with the students, look through their work with them, look through the comments, and get the child to say what they were proud of. And from the comments that would be read out to the child.

The child would select from those the ones that they were proud of and so they move from talk which was things like coloring between the lines which is sort of things that children say to actually saying things like well I'm really pleased I can do the tail on my now.

Or I'm really pleased that I know where to, how to write my name. And all of these really are actually helping that child develop that self-assistance skill. Where they can look at what they have done. Take the advice from what have commented. Then use that to make their own decision at their own target.

So even at an early age, children can do that.

Andrea: Lovely thank you Chris, anything to add to this?

Dylan: Written comments are obviously very helpful for children who can read. But for younger children people worry well how can I give comments to children who can't read and the answer of course is verbally.

The worry about verbal comments is that you don't create any kind of written record that proves you've been giving feedback. So what I encourage teachers to do is to give verbal feedback to a child. And then ask the child to go back to their seats and draw a picture or write a word, or maybe a squiggle that reminds the child about the conversation.

This has three benefits. One is to create a reminder for the child about what the conversation was about. Second, if they're using words that develop literary skills. And third, and most importantly, it provides proof that that feedback intervention did actually take place. Too often I think teachers are worried about proving they've been giving feedback to students.

Rather than worrying about the impact of the feedback on the students. So I think it's important to design ways of getting feedback. Prioritize helping students. And then we have to figure out ways of proving that those things have taken place rather than actually making the evidence collection paramount which is what happens in my view too often in most classrooms that I see.

Andrea: Thank you Dylan for that again a great question and some fantastic ideas from both Dylan and Chris encouraging us. That early year students can still do the things we're talking about with support from their teacher. So we've got another question then Chris which is about early years teaching, this is from Asma Ahtisham.

Asma asks as an early years teacher we have to hold our objective on one hand and formative assessment on the other. How can we juggle these two and how can we break down high priority learning objectives that are measurable. Is it critical to check every single day on how well our students have mastered those objectives?

Chris: Okay, thanks. Actually, it's quite interesting when you read it out, Andrea, because I read the last question, is it critical or not? It is critical. Because I was going to answer it by saying no it's not critical to check every single day. So I hope I'm not disagreeing with you Asma to start off with.

I think the thing with learning objectives, they are important. They're important I think mainly to help us as teachers to plan our activities. To make sure we're covering the type of learning we want our students to engage in. So they move towards the sorts of outcomes that we would like to see.

In a four, five or six year old. However, I think that there can be a tyranny of learning objectives where teachers are so keen to get children to demonstrate that they have the outcomes that match that objective. That sometimes we don't focus in on the learning, what's the learning that's taking place?

And it may not fully be what we expect sometimes because children as with students of all ages sometimes progress at different rates. And sometimes we can't anticipate how a stimulus that you give them in the classroom might cause them to react in one way or another. I've seen examples where young children in classrooms are so switched on by the activity and by talking with others about that activity, that they actually express far more than what's intended for the learning for that lesson.

So in other words, they exceed the learning objectives and get extra things done. Equally, if there's something that you really want to make sure that the child is doing. Like maybe improving hand writing or possibly get them to recognize how questions from why questions. As you read to them from the big book as they sit on the carpet.

Then clearly if that's what you're after, maybe you've got to practice that several times until many of your students can demonstrate that they've actually shown that. But I think the one thing that early years teachers do that is on the whole better than secondary teachers like I was when I was a teacher, if they're very good at drawing together all the evidence that they've got, the evidence they've got form many different activities.

The evidence that they've got from many different people, from the teaching assistant, from the parents etc. And using that as evidence to make decisions about those next steps. So I would say worry about objectives when you're looking at your planning. Worry about objectives sometimes if you think there are key objectives and maybe students aren't meeting them.

But apart from that, do which I'm sure you are doing is concentrate on the students' learning. Look at the evidence of learning and look at what you can do to actually encourage that learning more because that's the most important thing in the early years teaching.

Andrea: Lovely, thank you Chris.

Dylan, anything you might add?

Dylan: Yeah, I think asking those questions is very important because she highlights the fact that teachers need to hold learning objectives in their head, while their wandering around and interacting, particularly in the early years. The difficulty is that most teachers can't do that.

And until you've taught a curriculum for many years, you won't be familiar with all the learning objectives. So I think Chris made an important point about relating this to planning. I would advice teachers in your planning think about what three or four things are you going to be looking for as you wander around, as you interact with the children, and prioritize those.

As Chris says sometimes you'll see evidence of things you weren't expecting to see and the best teachers are always sensitive to those opportunities. But I think it's always a balancing act. Do you focus on the things that you really want to get evidence about or do you become sensitive to the things that you might not of thought will come out.

And this is what experienced teachers do very well is whenever lessons take an unexpected turn, experienced teachers are very good at deciding whether this unexpected turn is a good way of taking the whole class as learning forward, or whether it needs to be closed off as a dead end.

And I think, thinking about that actively as a teacher, will this take the whole class as learning forward? Can I capitalize on the interest the students have just shown in this unexpected thing that happened? Or should I say, we'll just park at another time and we'll get back to the main point?

It's getting better at making that judgement I think. Again, as Chris said, it's focusing on the learning needs of all the children in the class. And seeing anything that happens as a chance to take that forward or maybe avoid being distracted by it.

Andrea: Lovely, thank you very much.

And Dylan and Chris said, thank you Asma for your question there. Our next set of questions are about questioning. And I'm gonna ask Dylan first. So, we just got somebody else from primary. It's fantastic that we get instructions to use that are relevant for our youngest students as well as our oldest.

So, Zaima Anwar asked a question, I am really interested in learning effective questioning techniques with examples from primary level. So over to you, Dylan.

Dylan: I don't have a set of videos ready to share, but the things that I've seen that have worked very well are when teachers think very carefully about the questions they're going to use.

Often plan them in advance as part of the lesson planning. In physical activities like physical education, you can often see what's going wrong with the child's learning. But with mathematics or science, you can't look inside a child's brain to see what's going wrong. So the starting point for effective feedback is actually getting the right evidence in the first place.

And that involves thinking about questions. So I think, planning the question and then thinking about who you're hearing from? Who am I getting evidence from? And the really crazy thing that we do as teachers, I think, is this idea of making a decision about the learning needs of 30 students based on the responses of confident volunteers.

So I think that what I'd go into a classroom concerned about is, how am I gonna get evidence about what's happening in the minds of most of the students in the class. Rather than allowing myself to become distracted by the confident students who are always willing to share their thinking.

And so, it's just getting into the habit of thinking about ways of getting better quality evidence about what it is that you need to do next, on the basis of what's happening in those student's heads right now.

Andrea: Lovely, thank you Dylan. Chris, anything you would like to add.

Chris: I think we've got some general ways of doing it within the MOOC itself. So I've always found question stems are particularly useful. We've already got those somewhere in the MOOC to cover which activity now. But basically with these stems, whatever your topic that's coming up, you can use them to design some questions in advance.

And one of the tips that one of the teachers told me, in fact, I found really useful for my own teaching and to help others, is to think about sorts of answers that you might give. So, one of the question stems is is it true that, so it might be is it true that all green organisms photosynthesize?

If we're talking about that's a second one, let me do a final one. Is it true that all fractions have a larger number at the bottom than they do at the top? And if you ask questions like that then you've got to think about will that make a good question in my classroom for what they're doing.

And so you have to think about well, what might be high attainers, the ones that Dylan has been talking about, the confident ones. How might they answer this question? And then how might those students who have difficulty accessing into fractions or to those senses, how might they answer that question?

Then how about that unusual child who sees things differently? How might they answer it? If you can think of three different answers to likely to happen in your classroom, then you know this is a good question for discussion. So, you better think about what the purpose of your questions.

Do I want a question that promotes discussion, promotes more of them talking because then as students talk, I can find out what they're thinking at the same time they can think about what one another is thinking. This of course, is different from the source of questions that we use later in the learning sequence, the hinge point questions, which as Dylan said, it's looking for that evidence across the whole class.

But the question stems, I find really useful. I usually get my beginning teachers working with them To write sort of six or eight questions and then select three that they're going to use within the teaching sequence and then get them to report back on how those questions have worked or not.

There's also lots of other people who have been working on questions. So some people look to solo as a way of looking at questioning, as to what to blooms and so on. It doesn't really matter what technique you use. It's just trying to get some questions coming up that you might find useful.

And certainly sharing questions with colleagues because you'd be surprised how maybe you haven't got a good question to use with That technology subject that's coming up. But possibly one of your colleagues in your school have said, when I this. It's very good at showing me, or it's very good at prompting discussion, or it's very good at checking on this understanding.

So share questions as much as you can, and write them down. I used to go from year to year as a teacher thinking what was that good question? And I used to try and read them every year, make notes of those good questions. That's the importance stuff that you need each classes.

Andrea: Brilliant, thank you very much, that's really helpful. I don't know if it's this, obviously we've got the National STEM Center online. They'll have resources as well I think. So I know that might be able to help. I was going through a filter search on there under questioning and primary and I'm sure there will be ideas with the strategies that Chris and Dylan have just talked to you about.

Okay, so our next question then Chris is from Varsha. Varsha is asking I encourage students to ask questions. So this is not teachers their skills it's about students. Frequently, they find that they have trouble expressing the problems and thus would appreciate any tips on improving the students' questioning skills.

I think we've already had some. Any more, Chris?

Chris: Always with these, it's just practice and training. Going back to early years again I think one of the best lessons I saw was when a teacher was reading a story to children as they were sitting on the carpet.

She handed out some cards, on some of these cards it said why or how or who. And if you ever question I think why, how and who were the main ones. And then, she would start reading the story and then after a page or so she'd stop and say.

I think we need a why question here. Talk with your partner, those who've got the why cards, come up with a question, the why question. So and then next time it might be a how question or a who question. And so, they started to realize that whenever you read the story or whenever you were looking at things.

These are the sort of questions that you should ask. But what this teacher then did which I thought was even better was she had got her TA to write down all the questions the children came up with and what they did at the end of the story was to go through some of the questions and decide which were the good questions and which were the questions that were not so good.

And that I remember this happening in one of her classes when she was teaching about the nativity. And they decided that asking questions like what's the name of the sheep in the picture might be interesting, but wasn't really gonna help with the story of Jesus being born. But asking questions

about what gifts have the wise men brought was.

And so, it's this thing really of helping children learn what it is to ask a question. Which are the good questions to then take my learning forward and which are the questions that okay, you might want to ask because you're nosy or interested but really they're not going to help learning.

They're just questions that you could ask. And it also is due to where I always remember reading about the peel project in Australia which is a project to encourage children, it's secondary children. To ask questions and they got awards for asking more questions in class and after a while they actually define what they meant by the source of questions that they wanted because the kids were just asking any question, just so that they'd actually get a point for actually asking the question and move towards the reward.

So, it is this way of helping students to understand which sorts of questions are going to be useful for their learning and the learning of others and what's the other questions that maybe, are not so useful? And this should help really, in that learning process.

Andrea: Well that's fabulous.

Thank you Chris, loads of really good ideas there. Dylan, I don't know if you want anything to add to that one?

Dylan: What we discovered in our work with children, particularly young children, is often they don't ask questions because they don't actually understand what it is they know and they don't know.

And we found a technique called plus and minus interesting. Very useful. So the idea is after a piece of work children are encouraged to make three quick reflections. Something you found interesting, something you found difficult, and something that you found interesting about the task. And what we found is that when teachers use that kind of procedure routinely.

Children become much sharper and more focused in their questions to teachers. So, I remember one year three girl, she actually wrote I don't understand when you borrow which column you borrow from when both are zero. And that is just so useful to the teacher. When the students can articulate their difficulties in such clear terms.

They says the teachers give them an amount of time. So, it's about time, together with self assessment and reflection. What we discovered is that more teachers encourage students to reflect on their learning. They're clearer and sharpers students become in asking for help.

Andrea: Thank you. That's really helpful.

Thank you both and thank you Varsha for your question. So, our next question is from A Abbas and this question is for you first Dylan. This question is about multiple choice questions and Abbas asks

is it always the multiple choice questions which can be used as hinge point questions. They would like to know the alternative ideas for assessing pupils effectively in this short space of time, so that they can make the teaching more responsive and effective according to the students' needs.

Dylan: Well, I think the starting point is what we call a hinge question or a hinge point question. It's just a point in a lesson when you might need to make a quick decision about what to do next. And so, the key idea here is that you can collect the information very quickly.

Now there's no specified format for this. You could use mini whiteboards. You could ask students to hold up answers on mini whiteboards or slates. But that tends to give the teacher a complicated data processing task. If you've got 30 students, 40 students sometimes each of whom has written something on their slate, then it's going to be very difficult for a teacher to make sense of what it is that the students are saying to you and what to do about it.

That's why we like the idea of multiple choice questions. Because in a sense they pre-process the teacher's processing task and it also causes of course the teacher to be very clear about what they're doing. So if the students say A I'll do this could say B I'll do this.

And so, I think the really important point is just it's about getting evidence. And how can you get that evidence quickly? Well, I think multiple choice questions are a very good way of doing that and it gives you a quick way of reading those. And of course also gives you a stepping off point.

Because you can actually say you thought the answer was A. Tell us why. You though the answer was B. Tell us why. And so, you can actually see the diversity then used by the teacher as a resource for getting good discussions going. If all the students answer correctly, you can move on.

If very few of them answer correctly, you might choose to re-teach something in a different way. But the most likely outcome is that some students will have understood and some students Haven't and that gives you a great chance for them using their resources in the classroom, the students.

You might ask one student who's given a good answer to explain their answer and another student who's given a good answer to explain it in a different way. And then you may ask other students which of those explanations did they find most helpful? So the idea is we can actually build on student's responses as a way of moving the whole classes learning forward.

Or I come back to this idea that the multiple choice question makes the teacher's job much simpler, and I wouldn't go away from that. Unless I was absolutely convinced that I had no idea what the students were gonna say, and that's why I want something like a mini whiteboard or slate just because I can't predict the students' responses accurately enough.

Andrea: Thank you Dylan. That's very helpful. I'm sure that will help Abbas. [CROSSTALK]

Chris: Not really I mean the only difficulty is these hinge point questions can be difficult to write. [LAUGH] So I think hinge point questions are great but it's getting your hinge point question really tailored enough so they are answering for the reason you think they are given.

So sometimes you might have to trial bits of that with classes to find out if it's doing the job that it's supposed to do. Once you get good hinge point questions, great, I find them really useful doing exactly what Dylan said, which is to let me know that now's the time to move on, that we know enough, we've got the general idea.

And now we considered move on on that and I think just pick up the one or two who's struggling with it, and deal with them in a different way.

Andrea: Yeah, absolutely. And that echoes of course what you're saying, what some of the people on the calls have been saying, that they found it really useful to understand what the hinge point questions are.

And then go through the peer process of writing them but when they've actually implemented them in the classroom that's when they find out whether they're doing what they wanted them to do and as you say it's an iterative process about it. Lovely, thank you for those questions. We're now moving onto a section where people have submitted questions about classroom discussions.

So as Chris said earlier, this is about using questions for a particular purpose, about getting our students to talk. So our first question which I'm gonna direct to Chris is from Amber Fatima. And Amber asks, how can we start a discussion in class when we've only two or three students?

And the class of students are below average. She put this question in many forums but has failed to get the right tools to assess and help with her students.

Chris: Well it's an usual situation to have only two or three students in your class. But I think it's pretty similar to whether you have two or three in your class or whether you have 20 or whether you have 30.

But it's thinking of what can stimulate that discussion. And I think with a group like that what I tend to do is to maybe use something like concept cartoons, the work that Brenda Keogh and Stuart Naylor did. And it's well worth looking at Milgate House Publishing because they produce a lot of these online.

But basically you have a picture of maybe four, five students with speech bubbles above their head and then looking at some phenomena whether it's something in science. Or whether it's something in geography or whatever it happens to be. And then they are saying what they think. And then at the bottom of the screen or the picture it says what do you think?

What this does is straightaway increase your class size when you got two or three to six or seven. Because what they're going to do when they see that is to agree or disagree with what various students and the teacher are saying. And at the same time, maybe that will stimulate the talk enough for them to start agreeing to disagree with one another, because that's what you actually want.

You want them to start sharing their ideas, to really think as one of their peers are talking, is that what I think? Or do I think differently, or am I not sure about that? And to encourage that talk that goes with that. So whereas I think Amber maybe needs to hold back and let them talk.

Maybe she needs to communicate occasionally with comments like tell us more or tell me why you think that or can you say more about that. So just encouraging that talk until they get used to doing that. Because however competent or practice they are in this, sometimes students prefer not to say things if they're unsure about their answers, so she needs to create that environment where making mistakes is okay.

In fact, making mistakes is something that all of us can learn from now just the student who actually is making them. So they get a much better growth mindset in the approach that they actually take. I think another group that would do well on this are the group at York.

University of York, so Robin Millar and Mary Whitehouse and people. They've written quite a lot of diagnostic questions in science where the first question asks you to make a decision about something that's showing you either an experiment or again a picture or phenomena. And then the second question asks you to decide on a reason.

So they're multiple choice the two of them, so on the first one you make a choice the second one you give your reason. This in itself just making those decisions in the beginning but then asking the students to justify and particularly if they've come up with different reasons for the same answer, or come up with different answers, again might stimulate that discussion.

So it's finding ways around Amber I think that can encourage the students maybe to look at what other students are doing through concept cartoons, through diagnostic questions, maybe even through giving them a test paper that you've mocked up where there are a few mistakes and ask them to be the teacher and find the mistakes and then get them to talk about it.

Those sorts of activities are useful in getting them to voice what they think about what others have done and in doing that you can start to gauge their thinking and so they can start to see their ideas compared to others. And they'll start to see the value of how using one of using as a resource is an important aspect in learning.

Andrea: That's fabulous Chris, lots of ideas there. Is there anything you'd like to add-

Dylan: Yes, there's one thing. I remember meeting a man called Robert Swan. He was the first

person to walk to both poles. And he was talking about problem solving in adversity. And he says something that's really struck with me.

He said when everyone is thinking the same thing, no one is thinking. That really made a lot of sense to me. So I think a point that Chris made there that was really important is you have to get some diversity into the discussion to get good learning to take place.

The work of Robert Bjork on long-term memory suggests that students remember things for longer when learning is difficult. He talks about desirable difficulties in learning. So unless we crave that grit, that challenge to the learning, students are gonna remember what we do. So in groups of two or three, which sound ideal don't they, generally we find that teachers do too much of the work.

It's very hard to avoid doing all the thinking when you're teaching a very small group. So Chris' suggestions, the concept cartoons, ideas of other students, these are ways of injecting diversity of opinion into the discussion. And this would appear to be really important for generating long term learning.

Andrea: Thank you both. Thank you both very much. Amazing ideas there. I'm already thinking that, again, I'm gonna be printing off the scripts which will be available afterwards, and to go back through and highlight ideas. Thank you both, as always constantly learning. Thank you Amber for the question.

Great, Edgar Lopez is our next question, Dylan. Edgar asks, how can he encourage the English students foreign language, ESL I think, I think that's the right acronym, to talk in a huge group of about 45 students when they're only having 3 English hours per week.

Dylan: My answer is - don't!

Chris: [LAUGH]

Dylan: Don't try. Don't expect students who are still learning English to talk in a group of 45. If you've got three students learning English and the other students are all fluent, then of course those three students are gonna be intimidated. So I think what you need to do is to create opportunities for students to talk in less pressurized settings.

So I think small group work, having students to try to discuss their work, doing think pad shares, all those kinds of techniques. But I just think it's unrealistic to expect students to have the confidence to speak in a language other than their native language, where they're not fluent in it in front of students who are very fluent.

So I just think you have to, the talk is really important. You just have to find a way to get less

intimidating to students. I would say the easiest way to do that is with small group work.

Andrea: Lovely, thank you, Dylan. That's a useful and forthright answer there.

Chris: I'd agree. What I've got ESL students in I mean it's a sort of ESL kids from the same country. I let them do their thinking in their own language because thinking is hard. And then to find the words to talk with one another or to talk with me or to talk with a small number of other students in English to explain their thinking.

I think Dylan's right, it's a lot to to speak in a class of 45. I would like to in French or Spanish. So I couldn't stand those students who are allowed to do it in English if their language is other than English.

Andrea: Thank you both very much.

ESL, English Second Language, isn't it, I had my acronym wrong. Thank you both very much for that. So our next question, our last question about discussions is from Maria Munawwar. And Maria asks, I'm gonna ask you Chris, group work is important but many times due to limited time we can't give students enough time to discuss matters thoroughly which results in the opinions of only the group leaders.

So how can she overcome that and get the opinion of the majority of the students?

Chris: Okay, so different techniques I've seen teachers use. One class, this is a class of ten-year-olds, where they said that they were having problems with whole class discussions, because certain students were calling out answers.

It wasn't that they were being naughty, they were just very keen. But it meant that other students just sat back and let these particular students do the thinking. And so this teacher thought, how can I actually change the sort of learning behavior in my class to get the children who are calling out to still do the thinking but maybe hold back on their own for a little bit?

But how can I also get the others, who are used to sitting back more engaged? So she introduced a game in the class which was called, where she gave each child five cards with a question mark on and she had a little yogurt pot on each table which were the box.

And when students answered the question in class, in whole class situations, they'd have to post question cards. And this is a teacher who was working in the north of England and she told me that she was going to do this, we discussed it over the phone. So, the following Monday, I couldn't be there cuz it's a distance from London.

She went half a break and said, I'm really worried, some of the kids have already posted all five

question cards. [LAUGH] What am I gonna do? And I said, just go with it. See how it goes. And I rang her later in the day and she said, it was amazing.

They obeyed the rules of the game. What actually happened after the morning break was when I did ask questions, those kids sort of look down on the table, realize they haven't got a question card to post, and then sort of nodding at other kids on their table to answer, or even whispering answers to other children on their table.

And some of the more reluctant ones gradually started to answer. After time, after a few weeks, what's actually happened was that the ones who liked doing the answering used to hold back and wait for what they called the smart questions. They started to realize that some of the questions were challenging that the teacher was asking, others were less challenging.

So they'd wait for really challenging question to answer, but they'd still be doing the thinking and working out, whereas others are getting the chance to actually answer in class. And over the course of three or four weeks, it changed the dynamics in that classroom, so that children were listening more to one another, more children were actually answering, and the teacher was being able to get evidence of a greater number of students and their understanding at a particular time.

The difficulty came when she decided she wanted to take the question cards away because the kids said, no, no, they like it. In fact they wanted to invent all these extra bits to it, like maybe some kids should have more question cards than others, etc. So she didn't change the rules, but she did let them have the question cards for another couple of weeks, until they all realized, the teacher and the learners, that they no longer needed this in order to get the classroom discussion working well, and take that away.

So in many ways this card game the learning environment so that more children could answer. It actually help classroom rules for those students. So maybe you need something lighter. I'm not saying necessarily that particular one, but it didn't actually take any more time. What it did was to share the question out more.

It's also encouraged those students to listen to one another and to think about the questions more than previously and more students got involved. So it's finding ways around like that you think you're gonna work with your class, and use that structure for a while until it starts to work and then once you've got it working and it changes the way that those students are working, then you can drop that and move on.

I also see you've got a second question. It says, secondly do rubrics help in assessment? My answer to that one is yes, if the rubric is a good rubric, but not all rubrics are. Rubrics are the sorts of things that you need in order to decide what it is that you're getting children to look at and what you're getting children to realize or value in that particular performance.

So if your rubrics are good and sensitive to the learning that you want then, yes they can be useful

as criteria for success. But if they're there really as a checklist or they're there simply to say some kids can do it and some kids can't, then maybe they don't work so well.

So good rubrics work well, poor rubrics don't. But that's the same with any assessment really, your assessment tool needs to be honed to do the thing that you want it to do, so it becomes a servant of the learning and doesn't limit the learning. Okay.

Chris: Quite a lot there Maria, sorry.

Andrea: Rubrics actually is Chris. Yeah I'll just say the transcript will be available later and it's well worth downloading to read and pick out all of the nuggets. Dylan is there anything you wanted to add to Maria's question about group work and talk?

Dylan: I think the really important thing is to draw on the research of the Johnson brothers and Robert Slavin on the cooperative and collaborative learning.

The research there is very clear, cooperative learning is effective when you have group goals and individual accountability and what is described in the question is a situation in which there wasn't individual accountability. If the conversation being dominated by the confident students in the group. Then you set this task up in a way that doesn't require everybody to make a contribution.

So the absolutely indispensible condition for effective group work is that one student in the group not doing what they're meant to do messes it up for everybody. And if you do that, you create that situation, then If I'm the group leader, I can't afford for somebody else not to understand this, because the whole group success depends on that person reporting back.

So for example, one of the mistakes that teachers often make is to allocate roles to students. And they tell in advance who is going to be reporting back. Well that's the one role you should never assign in advance. So you tell the group and at the end of this task one of you is gonna have to report back but I'm not going to tell you who it is until it is time to report back.

Now, if I'm the dominant, high achieving student in the group, I have to make sure that everybody in the group is ready to share the group's thinking. If that happens to be the person who was picked on to respond. So group goals and individual accountability or the research shows very clearly are necessary.

The sad thing is that about 90% of teachers in one survey say they do this but when observed only about 20% do because it's really hard. So if you're gonna do group work, make sure you got group calls on individual accountability. If you're not prepared to do that, then don't do group work.

Bad group work is less effective than teachers standing in front of a class and talking at them. It's a waste of time for a lot of the students. So done properly, group work does have a substantial impact

on student achievement. Done badly, it actually makes things worse.

Chris: Can I just add to that?

I mean, as Dylan was talking, it made me think of Neil Mercer's work. The thinking together, that work that he does. Where part of what we do is to do a series of activities to actually improve group work behavior So it might be worth looking, Neil Mercer's got a very good web page that's worth looking at but looking at the Thinking Together program and looking at the sorts of things that this was mainly for upper end of primary school and lower end of secondary school that indeed this works.

In English and mathematics and in science, but it's well worth looking at that and looking at ideas for training up your students to get their group work better.

Dylan: Picking up the point that Chris made about rubrics, Chris is absolutely right good rubrics help but I would add another condition.

Good rubrics help if the children understand what the rubric's are talking about.

Chris: [LAUGH] Yeah.

Dylan: And too often it's just slap the rubrics in front of the students and say, here's the rubrics, that's what I'm looking for. And I remember Chris telling me about a child in a secondary school, whose teacher had written on his lab report, you need to be more systematic in planning your scientific investigations.

Chris asked him, what does that mean? And the boy said, I have no idea. If I knew I had to be more systematic, I would have been more systematic first time around. So the point is, we often used words that are clear to us but are not clear to students.

And I think we rush too quickly to do rubrics, I think rubrics should be developed as the culmination of a process of sharing quality with our students that starts sharing actual examples of work. So actual samples of work are far more effective that rubrics in getting students to understand what good work looks like.

Three cautions. One, don't just have one example of really excellent work, otherwise students will think it's a model to be copied. Be wary of making the good example too good, and many students saying, I can't possibly do that, and therefore they just give up. And thirdly, if you want to illustrate to students what really good experimental design looks like, make sure it's really good experimental design with poor handwriting and bad spelling.

Chris: [LAUGH].

Dylan: Teachers tend to produce perfect examples when sharing with students. And so there's lot's of things that are good about this. And so you're not giving the students a chance to work out what it is you're really focusing on. So if you want to make a particular point about what a well designed experimental write up looks like then focus on the well designed write up and not the presentational features, focus on the intended features rather than the unintended features.

Andrea: Brilliant. Thank you both. I was going to say [INAUDIBLE] because we've got another question later but I'm sure those ideas [INAUDIBLE] are very naughty but it's my fault for leaving that in. So thank you very much. One other thing actually while you're both talking I don't know of Neil Mercer was part of this Chris you know it's the PSTT they did some argumentation on online CPD packages about running discussions, the Primary Science Teaching Trust, I just wondered if they would add to our collective discussion about discussions.

Right okay moving on then thank you about those questions about discussions, we're not gonna look at some questions which are very much about what's happening in the classroom which I think they all have been but I labeled these classroom practice. So our first question Dylan is from Chanthoul Seam.

Chanthoul asks how do we apply our assessment effectively in the classroom? I've got loads of ideas already. What types of tools should we use to assess our students? How many questions should we ask our students? What type of assessment is best or our students? And so on.

Dylan: If I had the answer to that, I would write a book about it and make millions of pounds.

It's a very complex question I'll just start and Chris can chime in.

Dylan: I think to give us information an assessment is primarily a process for making conclusions. We give students things to do, they respond to those things and on the basis of their responses we make. Conclusions about what it is that needs to happen next.

So I think the really important thing is to think about assessments as evidence eliciting procedures. Sometimes you go in very open endedly, you might ask children, which is bigger 2x or x plus 2? That's a very nice question to get a really interesting discussion. Some students will think, well, you're doubling so 2x has gotta be bigger than x plus 2.

But then some other students will see, well, hang on a minute. It actually doesn't work with some numbers. So sometimes you go in with that kind of very rich question. In science in particular, I think we also can save a lot of time. If you go in with a specific focus on what are called model revealing activities.

So these are activities that are particularly useful in science teaching for revealing the mental models that the children are using, model eliciting activities or model revealing activities. So I might go into a science classroom. Just to find out what kind of models children have about objects in

motion for example and they'll see and most children might say that after a while an object in motion will slow down.

And so the important thing is it's about an assessment is a way of getting evidence for the purposes you need to use the evidence for whether it's summative to draw conclusions about the mastery level or formative about what to do next. But as long as you're focusing on how am I using evidence to draw conclusions then you'll probably be on safe territory.

One more important writer to that if you like, people talk about data driven decision making. I think that's generally a bad idea cuz people focus on the data. I think teachers should constantly be engaging in decision driven data collection. Start with the decisions you need to make and then collect the evidence that will help you make those decisions in a smarter way.

And so by being clear about the decisions you need to take and then collecting the evidence you will always know what to do with the evidence. It comes back to this idea, assessments are procedures for drawing inferences. You collect the evidence and we interpret them to conclude that it has a particular meaning about a child's understanding or what we should do next.

Stick to that and I think you probably won't go too far wrong.

Andrea: Thank you Dylan very as I should say complex question and some really interesting points there.

Chris: [CROSSTALK] Pretty comprehensive answer to it, I think the only thing I would add is if we talk about effective I think the other thing that we should try and do when we make assessments is use some of those learning opportunities as well.

So if you can, if it's appropriate with this assessment tool you're using. If it's something that's the evidence produce can help the children learn, or help the children understand better then that's quite useful. So let's say for example, we give children a test, a quiz, then next it's much more important to help them look at what they need to work on rather than to do what many teachers do just to go through the mark scheme because there are many question on it that the children don't need to look at the mark scheme for.

So focus on what most students in class are struggling with, try some more questions on that so they actually can learn how to do the particular type of question that's causing problems. And then give them ten minutes and say there's somebody else in this class who got the question right that you got wrong that we haven't looked at.

Go and find them, get them to show you how to work that question out. So that it becomes a learning opportunity. Similarly it's teaching them about what does value or what does quality look like in a piece of work is important. And I'm just gonna go back on this rubric thing because it just reminds me of an event that happened last week.

I don't know if I've told Dylan yet but my daughter Lorenza is actually training to be a teacher now and she teaches English not science or majors in English, but she's teaching an English lesson. And she showed me her lesson plan that was adapted from the one that her mentor normally did at that point.

She's studying Dracula, the novel. And what she decided to do that she got a model answer when it was an A grade, and she said many of her students do not aspire to an A grade stage. And so she decided off her own back to write an actual answer to the question at a lower level than the A grade but she quite smartly did it very neatly and she wrote more than the A grade and she just asked the students to decide which was better.

The one that was the A grade cuz I didn't know what grade it was, and the one that she produced as though it were student work. And then they had a talk with one another about why that was. It was only after that that she presented them with the mark scheme that would normally be used by the exam board to judge the quality.

And she found that a very productive lesson because it actually allowed the students to articulate what they saw as quality and they could see what the examiners were actually ascribing as quality. And when she got them then to do a similar type of essay she did the same thing where she got them to look at what they'd done and she decide was it better or worse, or in between the two modules that she'd actually given them.

And to justify that before again, she let them have the criteria to look at have the exam board actually assess it. So she's already starting to use assessment in a way that not only is informing her about how her students are doing and what she needs to do to adjust her teaching.

Well, she's starting to develop then this sense of quality that really is important that students start to understand otherwise we're gonna be tied to our students forever. Eventually they're gonna leave school they've gotta be able to access for themselves, they've gotta be able to decide next steps for themselves and that's part of what we should be doing as teachers, getting them to understand quality.

Getting them to understand how to use assessments in a way that helps them move forward.

Andrea: Lovely, thank you. Well done Chris's daughter. Okay moving on, our next question is from Nurdiyana and Chris I'm gonna ask you. So Nurdiyana asks, which type of assessment, traditional or authentic, are suitable to use to make sure that students get good achievement and learning skills in science?

Chris: I think it depends which country you're in cuz I just finished an EU project where we were looking at inquiring. And certainly in the UK the way that science is assessed by examinations does not really look at some of the skills that students would use in inquiry that most people would feel were important in terms of science.

So the written type questions in science examinations tend to look at analysis of graphs and interpretation of graphs. They tend to sometimes look at a little bit at things like should you do repeats or looking at precision. But apart from that they don't do many of the skills you would use in inquiry so they don't do the sorts of things that I think are absolutely vital like raising testing questions, or actually deciding whether you've got enough data to answer your questions.

Really, really important in terms of inquiry. So some of those skills I think are best assessed in an authentic way. If you wanna have a look at how some of our teachers have done this then if you go onto the Kings website, so www.kcl.ac.uk/sales that will tell you about one EU project we completed just over a year ago where there's lot of materials about how we work with teachers.

And the things like the sorts of ways that they went about accessing and then to follow that up we've got another one which is the same start to the webpage so www.kcl.ac.uk/assistme, A-S-S-I-S-T-M-E. This second one was looking specifically At assessments in four ways. The one that the UK teachers worked on was about the type of assessment you do in the classrooms through talk.

Through, some structured talk, but also through just the ordinary talk that goes on as children are working. You'll also see other types of assessments that colleagues from Switzerland, and Denmark, and Germany, and France, sorry, not Germany. Yes, yes, Germany. Germany were there. Sorry Germany. [LAUGH]
And Czech Republic did on such things as assessments of written work in science, or peer and self-assessment in science, and so on.

So, there's quite a lot there to actually help you see the types of things they did and what worked and what didn't, and also what sorts of training was needed in order to help teachers and students do that. So, I would say, yeah, we do need traditional so called exams every now and again, but really, I see them as a check, because the authentic stuff can happen many times during the year.

You also get richer insights into what that assessment is doing, because you've got the children there to go back and you can question them again if you're not sure did they mean this when they answered that to that particular bit in most written exams, the traditional way. That's not always possible to follow up.

So, I would think that you need to have both, but the authentic, I think for me, gives you a richer data that can inform your learning as it's taking place. Whereas the traditional, you need to analyze that and look. And that might give you more ideas really for how to change things, so the next year group coming through, or to pass onto the teacher for the following year for that group of students to say they need much more work on this particular aspect or that particular aspect.

So, authentic, for me I think every time wins over every time but you need both.

Andrea: Right, thank you, Chris. Dylan, did you want to add at that at all?

Dylan: Yes, I think it's important to realize that authentic doesn't have an agreed meaning so

different people use the term in different ways.

But when people are talking about traditional versus authentic assessment they tend to mean. On the traditional side the multiple choice test of content knowledge, an authentic assessment might be a way of getting students to apply what they've just learned in a real context for example. So, the authenticity if you like is it's something you can imagine a scientist doing rather than just a test of knowledge.

The difficulty is and here I'm speaking as a. The difficulty is that the score a child gets depends partly on their knowledge of science, but partly on their familiarity with the particular task that they've been asked to do.

Chris: Yeah.

Dylan: And so one of the things that we see with authentic assessments is, students get a high score not because they know the science, but because they're very familiar with the context that that particular task was embedded in.

If you think about English, if we ask students to write factual stories about dinosaurs, well, if the child is really passionate about dinosaurs, they're pretty good at writing about dinosaurs. And if they're writing about things they don't know much about, they're much less effective. And this really, echoing a strong insight from recent cognitive science research.

It turns out that you can't really distinguish between content and skill. Skill is content and content is skill. And so, the danger of authentic assessments is that we actually see a child doing something in one context, think they actually therefore know it, but in fact all we're really testing is familiarity with that particular context.

So, the evidence is If you were testing observation skills, for example, in an experiment, you would probably need to have six different experiments of those observational skills before you could be sure that you were testing this thing called observational skill, rather than just the familiarity with the context that they're actually experimenting in.

So, Chris is right. In general, I, we can get authentic assessment evidence. Then they are much more robust. It shows the students have got it, they can actually apply it. It's much more likely to be a lasting phenomenon. But the danger is that the context it effects are substantial, and therefore the results could be quite unreliable.

It's like magic, it's called a person by task interaction, the score the student gets is not just how good they are at science it's how well that particular task suited them. So, you shouldn't place too much emphasis on a single authentic assessment, because it could be that the child just got lucky.

Chris: Okay, that's quite interesting, Dylan, because the teachers on the project looked at.

Andrea: Yeah, thank you very much.

Chris: The assessment of the year. They called it it's a patch work and the patch work, some of them you had highly elaborate evidence and others you had sort of scrappy evidence coming out because of the different context and so on.

And it's really interesting when they talked about how their students had achieved. So they'd say things like I'm on the floating orange inquiry yet they were really good at asking questions and realizing how much data they wanted. But when it came to the bus go around the corner inquiry.

Some of them really struggled with that and so there is this, you're quite right. There is this context part to it that you need. So, it's one of the difficulties they had when they came to talk with teachers who weren't familiar with the inquiries. With how do you actually articulate that in terms of overall achievement.

However, because they had done something like six to eight large inquiries as well smaller aspects to it. They were much more confident in actually articulating how the students had done. And where they weren't sure, they had back up questions including hinge point questions to actually look at some aspects that they weren't so sure about whether students could.

Or couldn't do that particular skill. The other part of it which for me was really interesting was it changed their views about what we should assess within science. So, skills which we came to call 21st century skills like group work, communication, teamwork. They started assessing those as well as the ones you would more normally put underneath the umbrella of inquiry, like raising hypotheses or being systematic or whatever.

They started to assess as well. And they found those really useful when they came to write for students at various sort of letters that were recommending for jobs or recommending for them to go onto higher education. And that they can much, they're constant in their broader view of children's capabilities.

So, that in itself was kind of interesting, because, again, wouldn't really pick that up from the sorts of traditional assessments where they're just answering questions on a written paper.

Andrea: Well, thank you both very much. Thank you, Nurdiyana. We've got a wealth of ideas that about assessments and, a portfolio approach, to actually building up that picture of the student.

So, thank you very much.