KAREN FOLEY: Welcome back to the Student Hub Live (re)freshers orientation event. Wow, we've had some fantastic people from the Open University tell you all sorts of things like what you should eat when you're studying, how to spot fake news. We've talked about student support teams. And we've talked about creative uses with stationeries and had a look at assessment.

We've covered a lot. But what we really need now is some bangs and pops! So I'm joined by Rob Janes and Mike Batham to do some live science. So Mike, what's your role here at the Open University?

MIKE BATHAM: Yes, I am the lab manager for the Open Science on Campus Laboratories. And we make videos. We carry out labcasts. And we also do lab schools, which is a bit like a residential school but on a shorter time frame, so two to three days. And we do face-to-face teaching of undergraduate students.

KAREN FOLEY: Now you've brought some things in here today to show us. But your lab is a lot more technical than this sort thing, now, isn't it?

MIKE BATHAM: Well, one of the things that I do is I'm also working on remote experiments. So with remote experiments, the idea is that we create an experiment and the students actually perform the experiment from the comfort of their own home.

KAREN FOLEY: What sort of things would they do?

MIKE BATHAM: So we've already done one with infrared spectroscopy. And so the students make two compounds in the lab school, and then they analyse them by infrared spectroscopy from the comfort of their own home. And the one that we're going to launch in two weeks' time is a titration where they're looking at an acid and reacting it with a base and monitoring it with a pH electrode.

KAREN FOLEY: Wow, that sounds fantastic. When you say comfort of their own home, I mean, that sounds good. I'm just hoping this isn't too uncomfortable and whether I should be having looked at the emergency exits.

MIKE BATHAM: It's all been risk assessed, and it's perfectly safe.

KAREN FOLEY: Excellent. And, Rob, you're going to tell us about some of the level 3 labcasts.

ROB JANES: Yeah, we've got demonstrations that we do in all our labcasts here. But this is actually-- the first one I'm going to show you is actually from our level 3 chemistry module. And one of the key focal points of that module is actually metals and different sorts of metals.

So what we have here is solutions of nickel, not nickel metal but what we call nickel ions. And these are these green solutions. And basically the reason it's green is because you have a nickel ion, and water molecules are surrounding the nickel. But we can replace those water molecules with a different molecule and actually fine-tune the colour.

So this is something called ethylenediamine. And you'll notice that, if I just pour it into-- I'm not very good left-handed, actually-- into the flask, we get a nice colour. This is the same colour, or the origin of the colour is much the same as you see in gemstones, stained glass windows, that sort of thing. I'm just stepping in front of you now, Karen.

If I had some more ethylenediamine-- this is a slightly larger volume-- we can actually tweak the colour a little bit further. So we've got a sort of green with no ethylenediamine, blue, deep blue. And if we add a bit more ethylenediamine, we could even go a stage further, hopefully, and we get a deep purple colour. So tweaking the colour with a little bit of chemistry.

KAREN FOLEY: Wow. Excellent.

ROB JANES: OK, I think we're going to move these away from you for the time being.

KAREN FOLEY: HJ, have we got any science students out there in the chat who may be engaging with any of these labcasts? Or even-- I mean, this is reminding me of our conversation about highlighters. And I know that if you highlight, like, the green over the yellow and things, you can get all sorts of colours depending on whether you go too much into them.

HJ: Well, we'll have to find out. I know we had some science students earlier, and people were telling me we're having a conversation, a little conversation, about Oreos on the side, which I'm not sure if there's a scientific test to find out which one's the best. But when it comes to highlighters, I think we're experts and we don't need too much practise with those.

KAREN FOLEY: I've been making a note of my favourite biscuits in my handy chocolate notebook, actually. So we'll put our--

HJ: What's on the top one? Do we have one?

KAREN FOLEY: Hobnobs still.

HJ: Hobnobs still. That's fighting through. But yeah, we'll have to find out here. But-- oh, we're looking at highlighter chemistry experiments as well. We had a thing about putting things in micros at one point.

KAREN FOLEY: Oh, yeah, we're not allowed to talk about that.

HJ: No. We won't do that.

[LAUGHTER]

KAREN FOLEY: We had all sorts of fun with that.

ROB JANES: Sorry. We can't help you with that one.

[LAUGHTER]

KAREN FOLEY: OK. So I mean, these labcasts that you've been doing, Rob. So this is something that students might be able to watch as part of their studies.

ROB JANES: I mean, the labcasts are all tied--

KAREN FOLEY: It's fantastic.

ROB JANES: --into the actual module. So they fit in with the teaching within the module.

KAREN FOLEY: And it's great because often people think, oh, studying science, you know, it's so practical. But this offers a way of doing things, both in terms of watching some of the experiments and also, like you say, Mike, about doing some of them.

MIKE BATHAM: Yeah. It's carrying them out at home.

KAREN FOLEY: Yeah. And it's not just the home thing because, actually, a lot of students generate a lot of data. So it's quite exciting as well to be able to get a massive data set you can then analyse.

MIKE BATHAM: Yes, yeah. So when they finish the experiment, they can download the data from it. And it comes down in Excel format so it can be picked up by Excel and other graph-plotting packages that we can use. So it's very good. And we can build up a bank of data, as you say, and see how it varies over the next few years. Can be very interesting.

KAREN FOLEY: Excellent. OK. Right, we've got another-- I'm going to stand behind you two gentlemen because, not that I don't trust anything going on, it's just--

[LAUGHTER]

ROB JANES: OK, so--

KAREN FOLEY: You are the front of show.

ROB JANES: What we're going to do now is move back to our level 1 labcast. And that labcast is all about oxygen, the properties of oxygen. And we always start out by making some oxygen. And we're going to do it here in two completely different ways using some chemistry--

KAREN FOLEY: Right.

ROB JANES: --and, if you like, using some physics. This chemical here is something called hydrogen peroxide. It has the formula H2O2. And you probably know that water is H2O. It's very famous. And being very small, chemists like to build models of atoms and molecules. And there's water with an oxygen in the middle, two hydrogens. So it's H2O.

And here we have hydrogen peroxide. Slightly weird shape. This time it's got two oxygens, two hydrogens, so it's H2O2. So it's like water with some extra oxygen. And we can actually release that oxygen using a bit of chemistry.

There's our hydrogen peroxide. It's not doing a great deal at the moment.

KAREN FOLEY: Chemistry and fairy liquid, eh?

ROB JANES: Well, yes, so you're probably thinking, what are we going to make?

MIKE BATHAM: --available.

KAREN FOLEY: Yes, indeed.

[LAUGHTER]

MIKE BATHAM: In fact, we refill it with a cheaper value.

ROB JANES: So this is a very slow chemical reaction. We speed it up using a catalyst. And there's our catalyst that goes in. I'm trying to do this on the--

KAREN FOLEY: Wow. Oh, my goodness!

ROB JANES: So if any of you are doing S111, you'll see my colleague Nick Chatterton do this outside on a much larger scale using the liquid catalyst, which actually-- well, actually, this isn't doing too badly about going everywhere. So--

KAREN FOLEY: Wow.

ROB JANES: --what we can actually do, try to do--

KAREN FOLEY: You can see the steam. It's hot.

ROB JANES: Yeah, there's loads of heat. And that's important for something I'm going to show you later on, actually. Heat-producing chemical reactions. You probably notice when I put this burning splint in-- I don't know if you're picking this up on camera-- the burning is a lot more vigorous. I can even go a stage further, blow it out, and it's re-lit. Can you see it relighted in there?

KAREN FOLEY: Oh, yeah.

ROB JANES: And that's one of the key properties of oxygen. Things like to burn in it. Or we say oxygen supports combustion. So I'm glad that's died down. I was getting a bit worried.

KAREN FOLEY: Yeah, you never know how much is too much.

ROB JANES: I don't want to make a mess of things.

KAREN FOLEY: No. Wow.

ROB JANES: And what I think we're going to show you now, or I think Mike's going to do, or we'll both sort of do between us is a little bit more elaborate. It's actually to make some oxygen using a bit of physics.

KAREN FOLEY: OK.

MIKE BATHAM: OK, so what we have in the blue dewar is liquid nitrogen. So it's nitrogen that's been cooled down to minus 196 degrees Celsius. And we're going to pour it into the cola can. And--

KAREN FOLEY: Is that a good idea?

MIKE BATHAM: If I'm--

[LAUGHTER]

--again, there will be a little bit of steam.

ROB JANES: We only want a little bit, don't we, for this? There we go.

MIKE BATHAM: Yeah. OK. Now it's cooled the can down, and what you see is liquid oxygen, which has a boiling point of minus 183 Celsius. And that's condensed at the bottom of the can. And if you look at the closeup, you can see droplets of liquid oxygen have fallen onto the watch glass.

ROB JANES: So let's prove it's liquid oxygen.

MIKE BATHAM: And let's prove it's liquid oxygen.

ROB JANES: Remember the glowing splint test? With a little bit of luck, we can actually-- I don't know if you're picking that up. You can see it relighting the glowing splint.

KAREN FOLEY: Wow.

ROB JANES: So that actually is--

MIKE BATHAM: --liquid oxygen.

ROB JANES: --produced by a physical method.

KAREN FOLEY: Gosh. No wonder you don't want people doing this sort of thing at home. I think it's best that you do it for them in labcast.

ROB JANES: I always worry about these people who make ice creams with liquid nitrogen.

KAREN FOLEY: Oh, I know.

ROB JANES: There's a high probability that you might start to make liquid oxygen as well, but I don't know. Who knows? Who knows?

KAREN FOLEY: --do they?

ROB JANES: And then we talk about combustion in the labcasts.

KAREN FOLEY: Yes.

ROB JANES: We've made some oxygen, and we do a few combustion reactions.

KAREN FOLEY: The safety measures are increasing.

MIKE BATHAM: Safety increases out, yeah.

ROB JANES: Yeah. So what I need is-- this is something called calcium carbide. It's a chemical that releases a gas called acetylene if you add water to it. And what-- sorry, I'll do it. Don't worry. I've got mine.

MIKE BATHAM: Add some water.

ROB JANES: Yeah, OK. I'm OK. We'll be all right with this one.

KAREN FOLEY: Are you sure we're OK doing this? I mean, I notice that this is here for the cameraman. But what about me?

ROB JANES: I'm not sure, no.

KAREN FOLEY: [LAUGHS]

ROB JANES: So we'll do-- if I get the right stuff. Now I don't want to put in alcohol that it made. I think you'd-- OK, so--

KAREN FOLEY: It's important to clearly label, isn't it?

ROB JANES: On acetylene, actually, you can see straightaway--

[POOF]

KAREN FOLEY: Oh!

ROB JANES: It starts to-- ow-- starts to burn straightaway. It's quite flammable. It's one of those fires-- actually, it's gone out. But it's actually quite difficult to put out because you produce more and more acetylene and it burns. Anyway, thankfully for us it's put itself out.

MIKE BATHAM: Yeah. Can you pass over the lamp?

ROB JANES: Oh, yeah, sorry, yeah. So that reaction actually has a practical application.

MIKE BATHAM: Yeah. So in the days before batteries and generators, the early cars and motorcycles used to have what's called a carbide lamp. And what you do is you put water in this top reservoir. And

it has a little needle valve, which allows the water to drip, drip. And the calcium carbide is put in the base here. And then the acetylene gas goes through this tube into a little burner. So it's like a little Bunsen burner.

And you light the burner, and you get a very intense flame, which used-- in this one, this was used on a motorbike and dates from 1912. And I managed to get it on a well-known auction site, which I can't mention, for a mere 25 pounds. However, it doesn't work as good as it did when it was in its youth, one has to say.

ROB JANES: Right.

MIKE BATHAM: But it's a good thing to show. And also, miners used to use these for their lamps, and cavers as well. And cavers still use it as an emergency. So if their batteries run out, they've got a backup lamp.

KAREN FOLEY: Oh, interesting.

MIKE BATHAM: And that's good.

ROB JANES: So we have another combustion reaction to show you, Karen. This is a little bit more--

KAREN FOLEY: Excellent. Good, good.

ROB JANES: We've scaled this down to what we normally do because obviously we're in quite a confined space.

MIKE BATHAM: Yes. Just move it up slightly.

ROB JANES: It's a mixture of a reactive metal called magnesium and a chemical called silver nitrate. And the magnesium basically kicks the silver out of the silver nitrate, produces a lot of heat. So much heat is produced to actually ignite the magnesium.

But the way-- these are two solids. So we need to get them mixed. So we do it by adding a drop of water. And we probably need to step back because Mike's going to use a water pistol to do it. So--

MIKE BATHAM: OK, so.

KAREN FOLEY: A water pistol?

MIKE BATHAM: Yeah. I'm going to show my James Bond skills and shoot it with a water pistol.

[SQUIRTING]

KAREN FOLEY: Eh-- oh, wow! [LAUGHS]

MIKE BATHAM: There we go. So you can see, the reaction is so hot it's actually melted the aluminium foil, you can see.

KAREN FOLEY: [COUGHS]

MIKE BATHAM: There's a little bit of smoke coming out of it.

KAREN FOLEY: [INAUDIBLE] water coming out of it. [LAUGHS]

ROB JANES: I think we'll get rid of that one, shall we?

MIKE BATHAM: We'll just put it in there to--

ROB JANES: So you're probably getting the idea now, Karen, that all these chemical reactions are producing loads of heat and energy.

KAREN FOLEY: Yeah, I'm in the wrong department. I want to come and work with you guys.

[LAUGHTER]

MIKE BATHAM: What we're trying to do is to show that science is fun. You know, it's not all serious. And it can be entertaining as well as informative.

KAREN FOLEY: Absolutely. Who wants to sign up for a chemistry level 1 module with me?

ROB JANES: Right, Mike.

MIKE BATHAM: There you go. Oh, yes.

ROB JANES: Can I have the next reaction, please? So this is something completely, completely different.

MIKE BATHAM: Now for something completely different.

ROB JANES: So we have to sort of set it up here. So we probably don't need the-- no.

KAREN FOLEY: Well, I know HJ wants to feed us some chat and we've put a bit of time. So why don't we take

a quick trip to the hot desk?

HJ: Yes.

MIKE BATHAM: Yes, some questions?

HJ: Well, Fran does say that that last one is a good way to spark up a conversation.

KAREN FOLEY: Ohh.

MIKE BATHAM: It's all very good.

[LAUGHTER]

HJ: But we've also got some people that are very glad that it's done through the Open Science Lab. So someone said, my flat's rented so it's best not that I try some of these.

MIKE BATHAM: Yes. Please don't try this at home.

HJ: And yeah, we are afraid of blowing some stuff up. But Jane says, wow, that looks fascinating, which it really is. Coming from a nonscience background, I love when you guys come along. And Amanda says, loving these amazing experiments as well.

So what I've done is I've posted the link to the Open Science Lab in the chat as well. So we can have a look at the experiments on that, linked it.

MIKE BATHAM: Yes, so people can have a go from the Open Science website at some experiments from the comfort of their own home. For example, they can do the flame tests. This is one that we filmed quite a few years ago, but it's still relevant today.

ROB JANES: We also add that in S111 and S112, there's a whole lot of kitchen table experiments as part of the module. So students actually get the chance to actually carry out experiments themselves.

KAREN FOLEY: And for people who are not sitting in science, is there much on OpenLearn that they could engage with?

ROB JANES: Loads of courses, actually, yeah, yeah, yeah. Including home experiments as a module. A short course on that, yeah.

MIKE BATHAM: A module on experiments. And a module on water quality, which we filmed a few years ago.

KAREN FOLEY: And great for doing with your kids if they've got these homework assignments as well. So OpenLearn, for those of you who don't know, is a range of free content that's available from the Open University, often from modules that we've got going on. So it's a great thing to look out for. And in particular, if you're getting ready for study and have a couple of weeks spare, you might like to check out what's available for you. OK, this looks interesting.

ROB JANES: OK. So I think we've probably given you the impression that all chemical reactions produce heat but--

KAREN FOLEY: Yes. And smoke.

ROB JANES: And smoke. But that's not the case. This is something, as I said a moment ago, completely different. Two chemicals. This is something called ammonium thiocyanate. And what I'm going to do-- you'll notice this is solid-- I'm going to mix it with a chemical called barium hydroxide.

Now Mike, I need a stirrer, actually, over there. So let's mix these two together. Before I do that, I've got to prove to you that reaction is not producing heat and in fact it's doing the opposite. It's taking heat in.

So what I'm going to do is, on this wooden block, just put a few drops of water. Hopefully it'll all become clear in a moment or two.

KAREN FOLEY: OK.

ROB JANES: Spread it around. OK.

KAREN FOLEY: Yeah.

MIKE BATHAM: I've got a better stirrer for you.

ROB JANES: Ah, fantastic. Yes, yes.

KAREN FOLEY: That's a more technical stirrer than one from the canteen.

[LAUGHTER]

MIKE BATHAM: That's right.

ROB JANES: OK. So the second chemical we have. Now there's another indicator that this reaction is producing-- or taking in heat. And the reaction's taking place is because something we can't

convey to the people watching online is the awful smell of ammonia--

KAREN FOLEY: Oh, no.

ROB JANES: --that is now being produced. It's not too-- we've scaled things down from our usual level. But--

MIKE BATHAM: OK. So ammonia is an alkaline gas. So one way we can test it is with an indicator.

KAREN FOLEY: Does anyone have a peg for my nose? It's-- [SNIFFING]

MIKE BATHAM: You can see it's turned from green to blue, showing that it is indeed an alkaline gas.

KAREN FOLEY: [SNIFFING]

MIKE BATHAM: And yeah, sorry about the smell.

KAREN FOLEY: No. Well, it's rather like one of your colleagues came along to the Open Day and they gave me these fantastic postcards about-- which planet was it? Anyway, it smelled of urine. And I've got these postcards and I posted them out to all the students. And it stunk. It was Comet 67P. And it was really, really bad.

MIKE BATHAM: Yes, yes.

ROB JANES: Yeah. OK, so we've not proved to you that the reaction is getting colder yet.

KAREN FOLEY: No.

ROB JANES: So remember the water that we--

KAREN FOLEY: Oh, my goodness.

ROB JANES: Can you see now it's actually frozen into ice?

KAREN FOLEY: It has.

ROB JANES: The heat of the reaction has dropped so much that we've actually frozen the water.

KAREN FOLEY: And is that ice around the edges as well?

ROB JANES: Little bit, yeah, little bit. So that's what we call an endothermic reaction. So it dispels the myth that all reactions produce heat.

KAREN FOLEY: Fantastic.

MIKE BATHAM: So heat is taken in.

ROB JANES: OK.

KAREN FOLEY: Amazing.

ROB JANES: I think the smell has died down now. Actually, it's not too bad. We thought we'd warn you, though.

KAREN FOLEY: Right. All right. So have you got a spectacular thing to finish on?

ROB JANES: Yes. Oh, yes, yes, yes. We've got three liquids.

MIKE BATHAM: Yep. So I've got three liquids here. So the first one-- let's get the right one. So the first one is alcohol. And in fact, we're using propan-2-ol, which is often called rubbing alcohol and used in hospitals, before you have an injection. OK? You can use ordinary ethanol, but what we found was you get--

ROB JANES: Is that the right one?

MIKE BATHAM: --a better--

ROB JANES: You got the right one there.

MIKE BATHAM: --a better flame.

ROB JANES: Yep.

MIKE BATHAM: Yeah.

ROB JANES: Sorry.

MIKE BATHAM: So I move that out of the way and then--

ROB JANES: Do you want to light it?

MIKE BATHAM: Yep.

KAREN FOLEY: Oh, wow.

MIKE BATHAM: So you can see it burns really strongly.

KAREN FOLEY: Yeah.

MIKE BATHAM: And the paper is in fact a polymer. It's a polysaccharide, so it's made of sugar molecules. They're rich in carbon. And you can see it's turned black and then grey as it's burned in oxygen to form carbon dioxide. It also produces nitrogen oxides. So any combustion reaction does that.

OK. So like all scientists, we have a control experiment. And for our control, we've got our paper and some water. OK. And immerse it in the water like before. And then when we try and light it, well, guess what? It doesn't ignite. And it shows that water suppresses combustion. And it's used in fire extinguishers, and the fire brigade have it in their fire engines. So.

KAREN FOLEY: Not very spectacular, if I do say so myself.

MIKE BATHAM: OK. So what we have here is a mix of water and alcohol. And I've got a theory that, if we immerse the paper in that water, then we can light it, and the alcohol burns on the outside and the water stops the paper from burning. Now are you brave? Do you think you could lend us a 20-pound note we could do that with?

KAREN FOLEY: I say, HJ, do you think that's a good idea?

HJ: Um-- ooh. Well, they are the experts. I know Jane was telling us about some accidents that they've had in Holland because they used carbide to produce combustion in a milk churn and it blows the lid off in her experience. So--

MIKE BATHAM: We wouldn't recommend doing it on that scale.

HJ: Not that one.

MIKE BATHAM: That's a little on the big side.

HJ: So is this a bit safer than that?

MIKE BATHAM: This is a little bit safer, yes, yeah.

ROB JANES: We do it in a trickle in the labcast, don't we?

MIKE BATHAM: Yeah, we have done it in a trickle--

ROB JANES: Not quite the milk churn scale.

MIKE BATHAM: --and blown the lid off. But we didn't want to do any damage to the cameras or the lights. So are you going to be brave and--

KAREN FOLEY: Yeah, I've got one in my--

ROB JANES: Just wonder what else is coming out of there?

MIKE BATHAM: In your chocolate notebook.

KAREN FOLEY: So yeah, there.

MIKE BATHAM: OK.

KAREN FOLEY: My essential stationery things.

MIKE BATHAM: Yes.

KAREN FOLEY: That's my biscuit fund.

ROB JANES: We have to use twenties these days because all these plastic tens and fives around that has ruined our act, actually, hasn't it?

KAREN FOLEY: Oh, has it?

MIKE BATHAM: Yes.

ROB JANES: It's increased the jeopardy.

MIKE BATHAM: Yes, yeah. Increased jeopardy but lowered the value.

[LAUGHTER]

So, yeah. Now if we just take it up careful, careful.

ROB JANES: Yep. I'll just move it out the way.

MIKE BATHAM: OK, move it out the way.

ROB JANES: So we don't-- OK. Your 20-pound note.

MIKE BATHAM: Look carefully.

ROB JANES: Has Karen got money to burn, I wonder?

KAREN FOLEY: Oh, no. It's not burning.

MIKE BATHAM: Yeah. It burns very, very quickly. And you can feel, it's quite damp.

KAREN FOLEY: Yeah.

MIKE BATHAM: So the water has prevented the 20-pound note from igniting, and the alcohol burned on the outside.

KAREN FOLEY: Oh, wow.

MIKE BATHAM: Thus proving our theory correct.

KAREN FOLEY: Ah. So I'll buy biscuits with them. I can se--

[LAUGHTER]

Wow. That's fantastic. Excellent. Well, thank you both for demonstrating all of this. What do you guys think at home? Who's signed up for a science module, and who's interested in studying science at the Open University? HJ, what's everyone talking about?

HJ: Well, just about in awe and think you're very brave in giving over 20-pound notes. But all in the name of science, isn't it?

MIKE BATHAM: That's right. The things we do for science.

HJ: But we're looking at the OpenLearn courses as well. So I'm quite interested in the water quality one, especially given where I live, because I live by a very big factory and it does worry me. So it's interesting to see the practical applications as well of what we're learning about in our modules and the experiments as well.

MIKE BATHAM: Yes, yes, yeah.

KAREN FOLEY: Any advice, gentlemen, before we go about students studying science with us? Because a lot of the science modules are online. And we've been talking about various uses of stationery, various things to read with. And also in our big camp last week we were talking about making the most of PDF readers, annotated PDFs, and really using your online material to the best

advantage. Studying science involves a lot of different things.

I mean, people will have audiovisual material. They might be watching chemical demonstrations. They might be seeing a range of different formats. What advice would you give to new students out there about trying to amalgamate some of this content?

ROB JANES: Yes, it's quite a challenge, actually, studying online. And as you say, Karen, it's enabling us to bring together so many different forms of media, a whole variety of blended approach, the way we teach. Advice. That is difficult, really, to give any particular advice.

MIKE BATHAM: Perseverance. You've got to persevere. And please attend the tutorial.

ROB JANES: Got the tutorials, yeah, yeah.

MIKE BATHAM: And watch the labcast. Even if you can't make it on the day it's recorded, so you have a chance to watch it again. And you might think about watching it again before your examination just to refresh your memory.

KAREN FOLEY: Yeah, some good advice.

ROB JANES: Yeah, yeah.

MIKE BATHAM: Yep, yep.

KAREN FOLEY: Excellent. Well, thank you both very much. Are there any questions anyone's got about studying science before we get ready for our quiz?

HJ: I think Ronald was saying about health and safety. But I suppose with the level 1 where we do it in the kitchen, we're not so worried about that. But--

ROB JANES: The experiments all have been risk assessed. I mean, we don't ignore it.

HJ: Yes.

[LAUGHTER]

I think some of us know that we sometimes give in to the temptation to maybe set some fire that we shouldn't in the chat, it seems. But no. We've really enjoyed it. And everyone's having a look at the Open Science Lab and the webcasts up there as well. So yes. Thank you from everyone in the chat.

MIKE BATHAM: OK.

KAREN FOLEY: Wonderful.

ROB JANES: Thank you.

KAREN FOLEY: Well, thank you very much, Mike and Rob, for coming along today and giving us some chemistry. OK. So you've met some fantastic people here at the Open University who have told you about how to study, what They do, and shown you, really, why the Open University is such a vibrant, fabulous place.

Well, next in store for you, we have our famous Wheel of Ologies Quiz with Professor of Planetary Sciences Dave Rothery as quizmaster. You at home will play against our audience, teams from the Research and Academic Strategy office. The quiz is loads and loads of fun. And we're going to play you a short video about social workers. And we'll join you in a few minutes for our quiz. See you soon.

[MUSIC PLAYING]