Chemistry Academic Skills Session

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SUMMARY KEYWORDS

electrons, periodic table, ions, quickly, gcse, nearpod, oxygen, exam, element, moles, chlorine, oxidation state, atoms, oxidation, answers, fill, magnesium, write, question, mass

16:34

Hi guys, I hope you all can see my screen. Can you give me a thumbs up if you can, hopefully, you should be perfect. Okay, so hi guys welcome to the chemistry enrichment session. This is essentially an odd 90 minute session, session where i i basically build a bridge from your GCSE knowledge to your a level knowledge, and what to expect and how to essentially also do well in Chemistry A level and what are the little missing bits, we're going to tie those. Feel free to make notes, just, just so you know so feel free to have a pen and paper next to you or if you prefer digital notes. So, you should be. You can also do that. So today's topic will be covering essentially the fundamental, fundamental topics that you have covered in GCSE and how they will also appear in a level. So some of, some of them are atoms ions bonding energetics, but in a level, it tends to be more detailed and we'll see why and how. Also we'll be looking at some exam practice questions options will be those like six markers along with mathematic skills that are required at a level chemistry. So a level around 25% or 30% on paper tends to be very mapped based for a level chemistry, and all the tasks, I have Rachel should have given you. Haley should have given you the task before or sent it before. There were a couple of tasks for you to do, which we'll also be discussing in the session. But in this session, all the tasks are linked to the first module, which you will be studying in a level chemistry. It's based on spesification point so you will see these points and you will see these topics, again, when your teacher actually covers the entire syllabus. So yeah, if you have any questions, feel free to put it in chat. I will check the chat regularly. And if you want me to slow down just tell me that in the chat. Okay. Um, okay. So, in your GCSE I noticed that this year has been super hectic and it's been online for you. So but in your GCSE you should have covered atomic structure. Structure and Bonding. The basic organic chemistry. When I say basic I mean, like naming your organic molecules. So like alkanes and alkanes. And along with trends and data so like group seven group one. So those kind of trends, along with oxidation and reduction. So you should have covered this in your GCSE, but in a level of an ALA will go a bit of detail. We'll also be talking about quantitative chemistry so more like moles, Have you got, if you have walked out malls, can you please put a thumbs up in the chat, just so I know how much detail okay you have, so you know about the Avogadro constant then. Okay, so you know what the idea of what mall is. Okay, perfect. Okay, that's really good. Okay. Um, have you heard of ideal gas equation, how to rearrange the ideal gas equation. No, you do, you do. Excellent. Okay. Okay, so we'll be doing a lot of equations today. Right. So here's just me repeating myself, these are the topics that you have covered in GCSE, but we'll be looking into more details. In this session, so I'm just going to quickly skip through the slides. Okay. Today is more about answering questions and how to use your knowledge properly in these questions

and how to gain full marks. So, in GCSE I'm just quickly going to do this do this in GCSE, we know about electrons and how they're arranged. We know that in a periodic table like when periodic table. Sorry. Periodic Table can give you the proton and the number of. It can give you the number of protons and the atomic number of elements, but it also tells you the number of electrons. So, the number of protons is essentially the number of electrons. If, if, in an atom but if it's an iron, it would be different. So just want you to know that

21:31
you will have used the rule of electron shell filling where the first shelf holds two electrons second holds eight electrons and third holds eight. And the fourth up to 18. You should have known this in GCSE but in a level, it's more complex. So, in electron structure, rather than shells, we go into a bit more details so the shells are essentially broken down into orbitals and orbitals, each orbital has a letter. So we have S, we have p, and we have d. So, S orbital can hold up to two electrons, P orbital can hold up to six electrons, and d orbital can fill up to 10 electrons. I want you to know this. Okay, so going into more detail now. So for example, how do we write this now. So hydrogen for example has only one electron in it has only one electron. Um, so, the way we will write it is one s orbital, so you go up in one s then, so it will be one s two s two P. There is no such thing as one p, so b One S, it goes up in energy levels. So, one s two s two p. And then moving. So, this is. So for example hydrogen only has one electron, so it will be one s one, That's how you write it in an exam. Right. But, for example, carbon, actually no, let's look at second period. So second period. That is lithium. Lithium has, oops, has three electrons. So, the first shell as Shell can can hold up to two electrons we know this. So, so for lithium it would be one s two, and then two s, one that's what it would be. Does that make sense. So, so one s, so essentially if you think of to pee, it's broken down into, I wish I could run this command on this. So let's say this is one s. This is two s. I want you to think of boxes on top of these. So hydrogen is just one so only one electron. You don't do full arrows you only do half an arrow. Okay. Now, think about lithium it has three electrons right. So it would be. So, Li as three electrons in total. So three electrons here. Just wanted to double confirm so one s, so b dot one is one, two, us two. So you do it the opposite way. But for, let's say carbon. So, after two s, you have to pee. So, okay, I want you to understand, s, s shell can hold up to two electrons, okay. You can see that right. So two electrons. So but for lithium, it would be different scenario, You would have let me, can I. You want to have this. So for lithium, it would be like this. Does that make sense because there are three electrons right, so one, two and three. Right now I just want to change it from lithium to,

25:37
let's say carbon carbon is a really good example, carbon has how many so got four or 566 electrons. So carbon has six electrons. So, we know one s s orbital can hold up to two, so we've got 1234 we've got two more electrons left to P can hold up to six electrons. So the way you do it is so six Electra we've got 123456 You never feel it like this, the examiner will not accept this mark, you have to fill the first row the entire row singly, rather than doubly so. So that's that. Um, And then, I should probably it's ideal to probably have a periodic table next to me. So, to up, so. Okay, so that's second period, trying to move this. Okay. Um, yeah. So, once one s and two ss filled, we start filling to peace. So as you can see that is nitrogen. Let me just quickly get the periodic table out, I think it's seven electrons but let me just double check.

27:34
Yeah it's seven electrons so it would be for nitrogen, it would have appeared one as to. Oh, you can see here. So, two s two, two p. So in an exam you wind right to px you would be so it would be forced up for in an exam. That's eight sorry. It would be three. So that would be for nitrogen if you were meant if you were writing it in an exam, you would write it like that. So let's say. So let's say this is not for nitrogen, this is just me using an example. Let's say your electron is filled so this is, let's say this is six. Now, but you still have more electrons to filled, what happens is you go into the next show. So that would be three s, then it'll be s remember fills out two orbitals. So, yeah. So all the electrons you fill singly, when it's in a diagram form, but when you write it when they ask you to write the electronic configuration, you write like this, but if they ask you to fill it in an exam, so they will give you boxes like these. For two up it's normally three boxes like this, you would fill it singly so like this.

29:34
This element, for example, the boxes one has 45677 electrons, So that's nitrogen, but let's say if it has eight electrons. I will fill everything singly in to P shell to p orbital, and then I'll fill it w like this, all the levels because they have the same energy, same energy, the electrons have to go in singly first for it to balance it out. Okay. So, as you can see like a periodic table, we progressively ascent, we have to, There are loads of electrons, essentially, right. So, rather than writing it forever. We can also shorten it. So, magnesium, for example, and what we can do is essentially lump all the p electrons together. So, let's say. Um, so in this scenario, flooring is clumped together so fluorine has an electron 567899 electrons. So what I just showed you here, Early on, they can be come together. When you write it, rather than you showing it like singly filled. So, this is for fluorine and for neon, as you can see it's Oh, it's below Florence as an extra electron so it's two p six. That's how you can tell,

31:18
but there is actually a quicker way to also write this and you can still get more for this. So for example, neon has how many electrons 6789 1010 electrons we know neon has 10 electrons, and magnesium in the, if you want to write to the shorter way. This is very ideal so magnesium we know has 10 and 12 electrons. I'm just going to write this down to make it easier. So magnesium has to have electrons right neon has 10 electrons, the shorter way of writing it is, if you just put the element, like for example in this scenario neon. So has 10 electrons and interest add three is two. So that becomes 12 So if I add 10 plus two is 12. So you essentially add the, the electron, know the element that is ideal for your element you're trying to write it for. So, in a lot of scenarios in a levels, examine is essentially using the arm, because it's very ideal, because as 10 electrons and just easier to write the rest of the electronic configuration. But, for example in chlorine situation it will be a bit longer. So neon. When you're using magnesium to write magnesium but when you're writing the configuration for magnesium, you can just use the shorter version, you don't need to write an E to need to do that you can just skip it and come on to three estou. Because when you're writing an E, you're basically telling the examiner yes I know neon has 10 electrons now I'm gonna move forward and tell you that magnesium has two more extra electrons for writing three s two. Does that make sense. Okay, so, um, for sulfur. It's an. It's basically the same thing but sulfur has, let's say, I should sell fast 16 electrons so you just add on again so neon has 10 We know that, so you do three s two, you write three s two and then three P two. So it would be if I want to clump this together and write in an exam, it would be neon three s two, and then

33:55
the three p. So, three p four. And then if you add together, plus two plus four. That is 16. But it gets more complicated as you go on, because there are more shells that you need to fill so it goes like this is the order when you when you need to fill it.

34:33
And it goes up in energy levels so you have one s which you fill first, then you have to s. So,

34:43
one s, then you have to us. Then you have to pee, you feel it singly first

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that I'm not gonna do the entire thing. But, you fill it singly first and then you have so one s two s two P, and then you have three years. Then you have three P. And then you have four s, and then three G. This is because the energy level for four s remember s orbital only holds two electrons so it requires less energy than 3d because 3d holds 10 electrons. The sharp subshells always hold 10 electrons. The only thing you need to know at a level is, S sub shells to electrons, P, six electrons, D is 10 electrons. So, because the because 3d electrons, they require more energy to fill in for as normally comes under so let's say if you're writing a electronic configuration for. Let me give you an element. Let's say something super long. So, not chlorine. Let's say calcium. Calcium is 20 electrons. So calcium has yet 20 electrons. So it would be one s two, two s two, two p six. So that's 10 electrons now. Now you have three s, two, three, P, six, so now that's 18. Yep. And now rather than starting at 3d you would do for us to.

37:04
Yep, so 678-910-1112 1314, and then plus six away. and I do this one, sorry, 678-910-1112 1314 1516 1718 1920. Yeah, that should add up to 20. So you won't start 3d You will start out for us. Okay.

37:37
Can I ask you to quickly write down one s two s two P, and just basically write down the rule, you fill in for us before 3d s orbital fills up two electrons, P orbital fills up six electrons do two of those 10 electrons. And then make sure you know that you always fill in singly, when they're asking you to draw it. Um. Um. So here's just a summary. So writing the electronic configuration, on, off, an element from hydrogen to Crypton, use your periodic table to find the atomic number. So essentially the number of electrons, you fill up the periodic table, you fill up the orbitals in order so one s two s two p three years. Three p four s 3d, and then four P, until you run out of electrons. The 3d is the awkward one, as I said, remember. Yeah, so remember to feel, as I've said this as well, so p and d orbitals singly, as far as possible before you pair them up. So in d orbitals, it would be five of these boxes they will give you, because the orbital can hold up to 10 electrons. So, so it would be when you fill them, it would be like this. This is a common mistake people do. They always rather than doing this which will get you three marks. They always do this so to here. And then to hit, that's incorrect. That's not right. That's not write that will not get you marks. This will get you marks. Okay.

39:54

Can I ask you to heal me just how many people do we have 52. Okay, so let me just quickly put a link in the chat. Just a second. Remember that order. Yes. Okay guys basically this online tool I'm going to use can only hold up to around 40 people and there are around 51 of us. So 1111 off you have to do it on paper or just put, just do it on Microsoft Word or something, just do it on word and then copy and paste your answer when I tell you to.

41:25
What I want you to do I'm just going to put it in the chart. And please join this, please click on this link, it's very easy for me to just look at your answers when you're doing it. Click on this link and you should be able to join the session. If you can't join the session, I'm going to put this on chart, I mean, you'll be able to see the presentation, and have a go at the question. There was an extension question, just so I know if you're able to work out how many electrons, how would you write the configuration for ions as well.

42:48
Is the screen paused at the presentation but I don't know when I move my screens, I'm not sure if it moves with it. So do.

43:41
Yes, yes please find the periodic table, just on Google, Just type in a level chemistry periodic table.

44:04
Also there are only 34 People who have joined the link. Feel free to six off you can still join if you want. Yeah, I can post it again. If you finished. Don't forget to submit your answers. I'm Rachel outside, probably did the whole thing because it's a good practice, more than anything,

48:02
I know there was a time on task and some of you require more time what I want you to do. Copy and paste your answer in a Word document. And then they're like, the Zoom link is, I mean, the presentation is still going so you can use that. I'm going to give you guys seven more minutes, I guess. Hopefully that's gonna be fine.

48:56
Make sure you fill in for us before 3d Remember. Just a quick thing with these questions, they often give us multiple choice questions in your a level papers, and they will often give you the wrong ones. And then you have to do, do them so. So it's a good practice for you to know them, like cats. This quickly caring for a couple of the answers. I'm just checking yours. So, Just two Minutes.

53:41
So just a second so I'm just reading the chart, I was trying to work out couple of them.

53:48
Okay.

53:50
Okay, a couple of you. Okay, majority of you've got it right, I'm just quickly reading through the chart. So Jonathan, you can just submit her. Okay extension of your will help you with the extension to as an E. It's oh two miners so it was a negative ion watershed. Okay. Okay. All of you should be able to see my, my screen, as in my presentation. I'm just quickly going through. Don't worry about the F orbital. You don't need to know. But it's after D It's an F orbital. So, oh two minus. And

55:17
let me just write that one.

55:23
So it should have 10 electrons because it gains electron, it's a negative ion. So, so two minus would be one s two, two s two, two p. Two. Does that make sense, because it has 10 electrons. Sorry my internet is the best. Sorry. That would be six. Yes, sorry I don't know why I wrote that would be six rather than two. You're right. That should be 6678 910. You can't if you want you can write it with the brackets and E, but I'm, I'm pretty sure majority of your, your teachers will tell you to put it in the full electronic configuration, rather than like brackets, but that's just a shorter way scientists prefer to write it.

57:13
And in an exam, it, it should tell you like in an air depends on a specification to specification, if you're, when you get your new books, when you get your a level textbooks and they have given you examples, and you can so if they have given you examples you can use it if they haven't given you examples, don't use it, basically. Okay. Okay, I'm gonna move on to a different chemistry topic, I will share the answers. And then we you can, you guys can check it and go for it, along with there is a baseline assessment as well for you to try. Is my. Okay. Can someone put it in the chat, when I say oxidation and reduction, what was the first thing that comes to your mind when I say oxidation and reduction, because there was no reason for this, so that's just gonna stay. What is on average, like you guys are telling me. All right boys all over you constantly we're always in an exam. Okay oxidation is loss of electrons and reduction is gain of electrons. Excellent. So I GCSE you learn, or work, but in a level there is more than oil work. So oxidation is essentially adding an oxygen to an atom and reduction is removing hydrogen, or you can say oxidation is removing hydrogen and reduction is adding hydrogen, or oxygen or hydrogen that you remove. So, essentially adding or removing electrons, when you're oxidizing some things you're removing electrons. When you're reducing something you're adding in ones so reducing agent, adds electrons to an element. So you learnt that in GCSE but now in a level have quite a lot of rules when it comes to oxidation and reduction. So, you know,

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you know that metals in group one, react to form ions that are plus one. So positive ions, so plus one. So the rule is, group one has plus one ions. So, for example, Na plus. And that group seven, the other rule is group seven forms, minus one ions and negative ions. Right. So we need that one forms positive ions and group seven example forms negative ions. So group one is losing electrons group seven is gaining electrons to be stable. So, when we say that sodium. When it has reacted. It has an oxidation number of plus one. And when bromide has an oxidation of minus one, it becomes a bromide ion. So, in a level you are, you will be working out the oxidation number and the reduction number. So the

oxidation state and element, for example na or O two. Or let's say c you any pick any element in a periodic table, let's say, it always, this is a rule, it always have the oxidation state of the number zero. If it goes under a reaction, the oxidation. So, when it goes under reaction. Read Redux happens so essentially if it goes into oxidation or reduction. But if it's by itself in its elemental state, it will stay zero. When an element is going under reaction in that reaction, It's either gonna gain an electron or reducing or gaining an electron or lose an electron. If it gains an electron, it's reduced. So it's, it becomes more negative. If it loses an electron, it becomes positive, because there's been a, then, then we call it the elements being oxidized. So elements, some elements have specific oxidation states as specific oxidation states. So for example, chlorine, you would expect it to be minus one, because it's a group seven, and when it goes under reaction, but it can have many oxidation states, for example, in this scenario, can you see NaCl, 00. Na is a group element. Sorry, but there is a there is a role in in oxidation and reduction in a level oxygen by itself, when it's by itself, when it's owed to by itself in its normal state, is zero, but when it's part of a compound here, for example oxygen here NaCl Oh, it's minus two. But this is a rule that you will learn. Okay, when it's part of a compound here, it's minus two. If, if oxygen is minus two chlorine has to be plus one for it to balance it out. So, here are just few simple rules. I want you to note down. So, metals have plus one. So, have a plus oxidation state when they react, oxygen, however, when it's part of a compound. So let's say Na Na, three. It has the oxidation state of minus two, but when it's owed to remember, this is why students get confused when it's over two is zero. Okay. I'm just going to write this down, to reiterate, oh two because you find oxygen in its normal state, as a gas is zero, the element is zero. But when it's part of a compound. For example here. For example, so 14 Minus. It has two minus two charge. Why do I get. We're so the rule is I want you to know that metals have a plus one oxidation state when they react oxygen has minus two hydrogen has plus one, except metal hydrides

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for a compound for sodium nitrate, to be balanced in an equation, when a reaction happens and you form a product or the charges have to be balanced. So how do we work out charges so I know my metal has a plus one oxidation state. In this scenario is we have one metal for example, sodium, sodium has plus one. I know that. Okay. Now, if the examiner asked me. Okay, walk out the workout the oxygen oxidation state for, let's say, n nitrogen. How would I know that so I know oxygen itself. When it's part of a compound it's minus two. How many oxygens are there here. So there are three right. So you do three times minus two. You get six, two, is that three lots of oxygen. And you know one oxygen has oxygen oxidation state of minus two. And there are three lots automatically that's minus six. And then to cancel it out for this element. Overall, this elements or this molecule to be stable, has to have zero. So I know it's na s plus one, I know, oxygen is minus six. So, if I cancel these out. I have plus five. So plus five, so basically six minus six is zero. Does that make sense. Yeah, it's just simple maths. Um, don't panic. it can be a bit difficult in this scenario, sulfate ion. There are just two rows I want you to remember. Okay. Oxygen is always minus two hydrogen has plus one state except metal hydrides okay. So sulfatide on here. So you've got, how many oxygens have you got, you've got four oxygen so four times. Four times two minus, minus two basically is mindset. And you know the overall charge of this ion is minus two. So, what number do I need to cancel this out and turn this into zero, plus six. Does that make sense. It's just simple maths. What I want you to do is go on Nearpod again. Can you guys go on the link I sent you

1:07:57
a like.

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I hope it's still on that link, I should have told you to not link. For those of you don't have access for Nearpod Don't worry. Just attempt this on a piece of paper. Ideally, you need a periodic table. Um, for those of you on the airport, I'm going to start the activity. I've started it if you need help, Just put it in the top. So far, can't be plus eight, because the overall state is minus two for that ion, it's a negative ion. So some ion if it has to mine. I mean minus two or minus or minus six, that is the overall charge. Guys, have a go now it should be fine. The Nearpod thing. So what are the oxygen oxidation state you have 10 minutes.

1:11:40
For those of you who were stuck I think it's three or four people. I know you're messaging me privately I'm just quickly going to message you so make sure you check your messages.

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Guys, I've given you example of group one being, plus one ions, think about group two, how many electrons do they normally lose to be stable, just one right. So, Wait, let me just quickly show you. magnesium is in group two. So loses two electrons. Okay, but so you've got all of them right, apart from one, and I'm just double checking I know you guys have queries about the age I'm just double checking it as well. Um, I'm just going to review the answers here as well. Please screenshot it or something quickly, So we can go back to it again. I will go back to this or I'll send it to Haley. Okay. So isotopes and maps. So, okay, when I, by the way when I screenshot I not screenshot when I send you the answers I'm going to send you a working out as well if that makes sense on the things you guys were stuck on, just so it's easier for you to follow again when you go back. Okay. So you remember isotopes, they're naturally occurring in an element, we can actually measure the amount of an isotope there is using mass spectrometer, in a, in a level you go in detail what a mass spectrometer is isotopes are essentially elements that have different number of electrons and not electrons different number of neutrons. For example hydrogen, one hydrogen. They all have different number of neutrons. Ah, yeah, it's a nonmetal.

1:18:09
Okay.

1:18:12
Okay, I want you to quickly type this in the chart. What I just want to get your understanding what must happen to the atoms before they before they are accelerated in a mass spectrometer, based on what you know about mass spectrometer, you, you must, you should have a basic understanding what happens in there and explain to me why the different isotopes, travel, not explained as well and

1:19:07
I've only got two people telling me the right answer or sending me on surprisingly. Yes, I understand, and drew is correct. You've got it right. Yes, Adrian, you as well.

1:19:35
And I'm here is a classic, a level worked out example how, when, how to work out the main mass. Yes, Laura. That is correct. So, so, what must happen to the ions before they accelerate, they are accelerated in the mass spectrometer, they must be ionized. So there must be ionize for them to accelerate in a mass spectrometer and explain why different isotopes travel at different speeds. That is because all ions, they, so the lighter ions have a greater speed, if that makes sense. And the heavy ions will have less speed as agent that is correct, lighter ions travel faster with the ions have the same amount of kinetic energy, but if they are lighter they have a greater speed. But can I just quickly focus on this example, can you see the chlorine example in this on this slide. So this is a classic three mark in a level. So, in this question. You've got, so in this scenario actually 75% of your sample consists of chlorine 35 and 25% of your sample contains chlorine 37 Given that the sample of naturally occurring chlorine is three, three quarters, there will be chlorine 35 and 25% of it is chlorine 37 They want you to essentially calculate the mean mass, how do we do this, so this is how you do it, we know we've got two samples, there's chlorine 35 and 37. We know, 75% of the sample is chlorine 35 So you do 75 over 100, times by 35, because that's your point 35 sample, and then you do essentially the same thing. You 25 over 100, times that by 37. And then you add those together. And then you have 35.5 that is why, on your periodic table. When you look at chlorine is 35.5 for atomic mass. Do we understand how to calculate the percentages. Yeah. Now, Let's have a go at. Okay. This question I'm gonna, I'm gonna allow people to access Nearpod for this, for those of you already on it. If you can't access Nearpod have a go at these questions. Use your periodic table. But for those on Nearpod. I'm just quickly going to should work now. Yep. Oh, Peter. Also while stressing that people often ask, What is the best way to revise for level chemistry. My tip is get one of those CGP guide specifically for your curriculum.

1:22:59
So, YEAH. I'll give you three more minutes, hopefully that should be fine.

1:24:59
Understand, I hope I'm saying your name right. Yes, Your answers are correct, it would have been better if you.

1:25:08
I think you've rounded it up, it's fine. I'm just going to quickly check as you're submitting your answer. I've only got one submission right now. I'll wait. I'm Sandra, I just want you to. Sorry, my mom just came in. Um, can I just, this is so annoying. Sorry, can I just quickly ask you to double, Sandra, can I just quickly ask you to double check that is B, B double check before me. Apologies. My parents just entered my room. Okay,

1:26:57
especially around 90% of you have the exact same answer which I'm really happy with. Some of you have given me the exact figures, it would have been better if you rounded it, but that's fine, that the answer is still, you can still gain marks with it so it's fine unless it says round it up in an exam. So the answers should be, this is essentially working out the mean percentages, which all of you have managed to do, let me just have okay we'll have 15 more minutes. So we're gonna work out some

moles, this is one thing, my students don't like doing but it, it's around, it's essentially a lot of marks in the, in an exam. So if you click on this link, it gives you the periodic table that a majority of boards using, using a level chemistry. So if you click on that, it should take you to the link. Okay, so I'm not going to go to too much detail, but, as most of you know what, more or less, and I've asked you before. So, essentially atoms are so small that we cannot counting counting them individually. So we say one mole of an atom, for example, one mole of magnesium is like. So if it was present in mass would say, we use the Avogadro constant 6.02, times to the power of 23. So, so let's say if I react magnesium or sulfur, I get magnesium sulfide. So let's say 24.3 grams of magnesium reacting with 32.1 gram of cell phone. These are the atomic, atomic masses. Remember, you get these from periodic table. War made 56.4 grams of magnesium sulfide. So, um, same scenario. Um, so more essentially presents a number of what the amount of atoms or ions in the molecule, or the element we're looking at. So, example one mole of sodium can consist of 6.02 times 10 to the power of 23 atoms is same for one mole of sodium chloride as well. It contains that many number of all molecules, but how do we link this, what, why am I, why am I using why do we need to use our partner. Because

1:30:04
let's say one mole of carbon. We know one molar has bought that many atoms. And this many atoms has a mass of 12 grams. Okay. But when it's a compound in an exam you need to make sure you either have the mouth h2o If you either have the master who should be okay. So, this is what work out moles, can I just quickly get you to write down this equation, I have in a triangle formula as well, to work out moles, you have to do mass over Mo. And later on, You understand, where does Avogadro's constant becomes very familiar like where do we use it. But right now, this is an important measurement. In a lot of topics. Okay. Um, let's say let me give you an example. Oh wait, this just to give you tip. This definition is worth two marks in an exam. One, one marks for mentioned the fact that 12 grams of carbon atom carbon minus two carbon atom and one mark is for this definition.

1:31:50
So, okay, I'm just thinking, Do we have enough time. Okay, so calculating more so a mountain more so let's say I want to work out how many moles, there are in NA o h. So, to work out moles in NA or hey, I'm going to use the equation that I

1:32:16
mass over Mr. To work out the number of moles, I need to do math over Mo,

1:32:23
being the muscles, Nao haicheng So, it's normally they normally give it to you in exams, but so what you will do is just quickly look at open my product table 23 laws. So if you do. So if you, if you look at the atomic number. So essentially, not the atomic number. Oops, sorry. So the atomic weight of the essentially the relative mass of the element. So, an A being 23, oxygen being 16. H being one that would give you the mass. Does that make sense. So you know the mass. Okay, now the M. The M I want you to remember, it's actually, sorry, the MMR is. It's the NA Ohio choose Mo Yeah, the math is given to you in an exam you don't need to work out the math because it's given to you. So, you know the equation for how to work out Moses mass over Mr. So what you would do eight grams divided by 40 that gives you two moles. Yeah. So that's how you work out when they give it to you in grams. Yeah.

And then, same goes for calcium carbonate. They've asked me okay what is the moles. How many moles are present in a 25 grams of calcium carbonate. I know the MR for calcium carbonate when I add on the relative atomic weights, and using periodic table is 100, so I'll just do 25 divided by 100, it will tell me I have naught point two five moles. Yeah. So that's how you work out moles. Oh, how would you work out the mass. So, you must have used triangles in GCSE so use this triangle, and essentially rearrange the equation so if I want to work out mass, What I will do simply is most times relative formula mass. So that is your other Godhra constant. So myself one more so you say, ah work, if I want to work out the mass of h2o, I'm gonna do, they will give me moles in an exam naught point five. Sorry if I'm rushing through this because I want you to attempt an exam question naught point five times 18 That would give, or tell me the mass of h2o. In this scenario, being nine grams. So what I would want you to do. Can you copy down this triangle in your on a piece of paper or in your book, anywhere quickly and do that I'm going to quickly give you an equation.

1:35:43
Actually before I do that I just want you to also look at how we can calculate relative formula mass. This is like a real question. So if I want to work out the relative formula mass, rearrange the equation again. So, mass divided by moles. In this question, they've asked me so 10 moles of carbon dioxide has a mass of 440 grams, what is the relative formula mass of carbon dioxide. So, what I would do is rearrange the equation again, mass over the number of moles and mass being 440 divided by 10. So the relative formula of carbon dioxide is 44. So that's one. So we know how to do that. So essentially rearrange the equation. Now percentage composition, how do we do that. So here's how we do it so they have asked me how much so in this question, calculate the percentage of oxygen in co2. So, you calculate your molar mass of the compound so co2 So, two oxygen 16 times two plus 12, which is the carbon carbons relative atomic weight, so 44. And then, what you would do you want to only work out the percentage of of oxygen and co2 So, you add the atomic mass of the element required which in this case is oxygen. So there are two of them so 16 plus 1632. Then you work out the percentage of oxygen in here so, 32 divided by 44 times by 172.7%. So that is a percentage composition question.

1:37:38
So, can I quickly ask you to try this. I'm just going to allow it on Nearpod as well.

1:37:53
I have started the activity on Nearpod, so you should be able to do it. If you have any questions, just in the chat.

1:39:46
Once you have finished the activity. I'm pretty sure a lot of you are still going for it. Once you finish or you're near the end, I just want you to quickly click on that link and ask me any questions that you want to know. For or any, anything you essentially any tips or advice you would like to know before you start your a level chemistry course. So if you just click on that Padlet, you should be able to

1:40:19
type any queries. If you could start submitting your answers, that would be great.

1:41:39
And if you could just upload the questions on that link. I will send a document to Haley, along with all the, along with this presentation, which she will just upload. But, yeah, yeah, thanks so much.