3-2: Metaphors and analogies

In this video, I'm going to share with you tactic that is very important if you want to remember ideas both longer and at the same time understand them better. These are metaphors and analogies. Humans already reason with metaphors and analogies all the time, it present in our language, it present in the way we discuss things, it present the way we teach things. Most of that is an automatic process, most of that is sitting in a classroom, professor uses analogy, you just need to understand analogy that they gave you. If you are understand the idea very well just comes up with metaphor automatically. Very rarely to be deliberately apply this process is very rarely doing say to ourselves and when it deliberately creative metaphors for the subject so I can better understand them.

The idea behind metaphors and analogies is that it helps you understand and remember ideas better in two ways. So the first way is that the way a metaphor works and the way analogy works, is that you're not just trying to come up with very superficial link between ideas. You're not just going to be just linking derivatives with dogs because they're both start with a letter "d", that's a very superficial connection. It doesn't bare anywhere sound almost like reality. What you're trying to do is you're trying to figure out what's the deep structure of the idea, how does it actually look as a structure and trying to find something comparable that has similar structure and the advantage of this is that in actually creating a metaphor for analogy, you have to see the entire deep structure of an idea. And this can be something that you don't pick up or you don't even realize you're not picking up when you're just reading a book or sitting an electro for the first time. It will long and say yeah, yeah I get that, I get what they saying. But if when the test comes, you'll not be able to perform on it, and the reason why is because you never really understood the deep structure, you just understood the surface layer. And so what's were going to try to do here is that creating a metaphors and analogies and try to match the deep structure closest as possible and even when you can't make a perfect match recognizing where it matches doesn't matched gives you so much insight on how your original idea works then you understand a lot better.

The second advantage on using metaphors-analogy goes back to the principle we discussed earlier. You're creating association between ideas, so creating a metaphor and create it connections, more connections, more access point to the idea, easier to remember. Second, you're making the idea more vivid, you're making it more emotional, and you're making it something you can actually connect with. So you're taking the abstract idea and making it the concrete one that improves memory. And finally, in many cases you can often turn a dull or dry situation into a story with characters and emotions and people acting. And we also remembers story better than we remember dry information. So uses all three of these memory principles and at the same time it allows you to understand the idea

better. So this is a better important technique for most subjects. Being able to use metaphors properly can accelerate your learning, accelerate your understanding. So an example of this, so I was saying, derivatives to dogs it's just because they start with the letter d, that's not a very good metaphor, doesn't really match the deep structure though. But consider the derivatives', so this is from calculus, consider the derivatives and compare to speedometer and odometer on a car so the speedometer measures how fast you're going and the odometer measures how far you've gone. This is exactly the same as derivative how function, the derivative is the speed of the function and the function itself would be the odometer and the derivative would be the speedometer of the car. And so creating this connection works on both of this way. One, we match the deep structure of the idea, there's not just a similarity and that they both start with the same letter, that is really explain the idea but by actually understanding, what is a derivative and what it is similar to and by making this connection doing the speedometer and odometer of the car. We've explored the deep structure of the derivative to its certain extent and compare it to something we already know. So explore the deep structure, we understood it better, at the same time, speedometer odometer of the car that is the vivid concrete analogy. We can imagine being on the car, accelerating and watching our speed go up dramatically and watching our odometer go up just a little bit. This is something that we can make very concrete we can see. Whereas if you just understand the derivative in terms of functions and that just lying on the graph, you maybe won't understand it on the same level of vividness or way you can remember that you would with this analogy. That's a pretty simple example but it's a powerful one because creating a bunch of metaphors like this would mean that could probably understand even more complex details about the derivatives. So the chain rule, office tell rule, you can understand this things in a more detailed way then you would if you just understood the calculations, on how you manipulates simples in order to get up. So that's the first thing, so that's an example using a metaphor in this way.

How you create metaphor? So we understand why metaphors are good, we understand why they can help you understand better but how you actually create them. So the first way I suggest, is just to be always in the mind set of what this is remind me of. So when you are in a class, when you're reading a book, ask yourself this questions very frequently, what this is remind me of, what is this like, what this is similar to. Sometimes you drop by, sometimes you'll find the idea, you can't think of anything that is really similar to very much standing or it's under unique but if you get the habit of doing this, you just automatically making small connections. So this is sometimes better than spending a lot of time deliberately creating a metaphor for an idea, you just spontaneously generating metaphors, even if not the perfect one's, just little one's all the time. You'll be understand the idea better, that's a very deep level of processing which will be discussing later sections and deep level processing means you remember ideas much better. That's the first thing, just try to be asking yourself what is this remind me of all the time, when you're going to a

course, when you're sitting on electro hall your taking notes, ask yourself that questions. When you're reading a textbook and you're taking notes, ask yourself that question. What this is reminds me of. Even asking when you're reviewing things, that's the first way.

The second way is, let's say when we deliberately create a metaphor, I want to remember this idea better, and how I remember it better. So the idea is to explore the deep structure of an idea and you can do these by matching features so use an example. So One idea you learn on economics is called Corno pricing, and basically the idea is that there are a bunch of different firms and they are all competing to each other and they are trying to figure out what price they should set their products in order to make the most money for themselves. This is other basic idea in economics and the analogy is that the Corno pricing is based on everybody decides how much their willing to sell at the same time they all deciding how they going to produce and what they wanted to do is they don't want to produce too much because then the prices will going way down and not of them will going to make much money. They don't want the market to flood with their product but at the same time if you really withdraw all of your, if everybody else in competing means withholds their product. You can make a lot more money just by breaking that, that sort of task or agreement and flooding the market with your product and making a lot of money. So the Corno pricing is a model of figuring out, well were in the middle will this company lies, were all we go between these. Where will the find certain equilirably point between incredibly greedy and sort of self centered or more cooperative because both extremes don't make you the maximum amount of profit. So what your company do in the situation.

So I was just try to think of how can I create a metaphor for this so it's a fairly complicated ideas, it's not really similar to everything else that you would encounter in life. So whatever we start by doing is matching features. So the first part is to pick maybe a subject matter where you think there's an opportunities for matching. Maybe I don't know what the metaphor analogy is going to be at, but I can say is ah wow why you know let's pick this domain and try to look for something that might be kind of similar. So one thing I tried to do is I try to think of children is playing. Because the relationship and complexity of children interacting in a playground or something similar like that, that is something that's vivid, something's very concrete it's also a story, you can think of playing in this narrative context as supposed to just added some ping pong balls bouncing around. That's also allows you to have those values from the metaphor we discussed in the first unit. But also there's a lot of complexities; it's not just a simple situation which only has 1 or 2 ways you can work. Children can play, and compete and engaged in a new different ways and that's a good basis for an idea. So that's one good basis for an idea, another basis could be physic another basis could be math, if you really understand some concepts in math. Math has tons of great metaphor and analogies for everything else. So there's lot of these, history and other one, you know feuding counties, these all different good sources of analogy.

So this one here, I'm thinking of children playing on a playground. Its good domain, let's think of what's happening. So first of all let's try to match the features so in the corno model there's going to be a few firms that are competing. So let's have few kids point, so were matching up the opportunities of few firms point there's a kids point, so we have 4 or 5 kids point. Now in the corno model there are competing over something, they are trying to obtain something, and then the economic model, they try to maximize their profit. So let's say, let's try to leak that into something in the model of the children. Let's say we want to have them competing over both of you, so they want to have the most balloons possible, remember that's be something that the children compete over, so they're competing over balloons. Now that we serve to establish a base connection between, right now we're not really exploring the depth of the idea; we're not exploring the deep structure but we have something we can work with, we have certain ball of clay so we can eventually sculpt to tool that we could benefit. So the idea is what is happening in the corno model that we can simulate is also happening in this model. So what's happening in the corno model is that there's a balance in between selfishness and cooperation and so there's sort of two extreme that don't really worked out and they're going to be somewhere in the middle, so you can think of it. The kids are trying to steal each other's balloons, but when they steal the balloons and they are very aggressive about it, they end up stepping on them, they got broke and pop because you know balloons are delicate things and if they fighting over them, sometimes they wreck the balloons and if they're fighting really aggressively, so they are in the pure competition zone that we are talking about with the corno model and they pop all the balloons and nobody has a balloon and that is not what they want. On the other hand, they can cooperate perfectly, so decide no, we're just going to divide the balloons equally and not touch each other, so you have maximum balloons. But in this case and this is sort of where, where trying to force the analogy a little bit. But in this case, one kid while the other kid are off plane and not paying attention, go around and try to steal the balloons, they try to steal the balloons from the other kids while they were not looking. And when he does this he could end up with more balloons and that is just what a fair split. So this is example or steadying the analogy. So what's going to happen is, because each kid is realizing that they're not going to be perfectly cooperative against steal a little bit to each other but they are not going to be unfolded stream and extremely aggressive that's how corno price model works,

Now so that was a fairly lengthy example but what it works is similar structure for actually creating a metaphor for something. So you pick a domain, if you really have no idea where it starts so sometimes there'll be sorts of obvious, if you're thinking about physics problem then maybe there's something in actual reality which may be example of physics, so when I was talking about derivatives, for me the speedometer or odometer of a car are really good analogy because that's what the speedometer and odometer car measures. They measure the derivatives. It's a really good analogy because it's not just co incidental

connection; they are actually the same thing. That's a really good time to use analogy if you're trying to understand the 48 transforming in physics or in a differential equation, the 48 transform. Understanding it is the way in turning pressure weight into pitch is a very good analogy because that is what you actually doing that's the 48 transform actually does. And so being able to make those connections, science will be obvious what domain you are work with or what are good domains versus bad domains. But if you really no idea; then just try to pick one that you think there would be something to play with it. And so as I said children playing on a playground is a very good domain because it has a lot of things you get the children to do which you can turn to a story which you can understand.

Feuding nations, nations fighting each other in a wars or nations cooperating with trades, that's another way you can think of it. This kind of relationships between the actions and countries, that's the way of understanding the ideas in a way that makes it a narrative makes it more vivid and makes it more concrete. And then once you chosen a domain, you wanted to start matching features. So starts try this line up as many elements of the ideas you can. Keep in mind sometimes you will be able to match all of them. So I was saying my balloon analogy kind of falls apart because the whole idea of the corno model is everybody makes a decision about what they are going to do at the same time. Obviously if the kids are running around in the playground and start stealing balloons other kids are also going to start stealing the balloons and you will be get to a devolve situation where as the corno model doesn't work that way. If one person decides, just you know laterally they start stealing from everyone else that of the other nation can respond or none of the other firms can respond. So that's a little bit harder to translating to this analogy.

So, don't worry if you can't always get a perfect fit, it's more important just recognize where it does fit. So try to have many connections as you can but if there is some place that is missing just recognize where that connections breaks down. Now creating metaphors like this takes practice. This is not a skilled that most people just have incurably. You can create metaphors but often if you just not, it didn't come to you spontaneously most people can go to thru this deliberate process that I just describe. And this is a process of a real example when I thought of it corno example, I don't have an idea what a good metaphor, so I have to create this one manually with the process I'm describing for you. So that's one thing, it does take a lot of practice. So if you're using it, your finding it very slow, it's not very efficient in the beginning. Again use the what is this remind me of in your courses, that's just generally will improve your ability because you will be getting more spontaneous metaphors but when you have to use it deliberately, it does take practice to get good at it. So don't expect something that will turn around your studies overnight but it is something that can really help. And finally being able to create metaphors is kindly link to how well you understand the idea. So I was only able to create that metaphor between those 2 concepts because I really understood how the corno strategy or the corno pricing

model works. If I didn't understand how it work at all then it very difficult to create that analogy. So creating a metaphor can be a bit of self test, if you can't create an analogy or something, maybe you don't understand it very well. And if you are in that case, there's a whole section in this course which will be coming up which is just about understanding the ideas better. So if you are covering ideas and you can't come up with any metaphors then consider going to those tactics because they will focus you not on creating the most vivid and memorable representations but just understanding it so can even get to the start. So consider using the final technique which will be discussing later in the course. Consider using that as a way of understanding the ideas better before using metaphors