Welcome back to this series of videos that we are putting together to give you an idea of how to construct a problem-solving or modelling task for Further Mathematics, Unit 3.

This video is going to work through the construction of the context and scenario that was developed in the introductory video. And we're looking for the data sources, the questions of interest that are going to be related to that, the content that can actually come out and then what part one might in fact look like as a written version to the scenario and context that was already developed.

So in terms of the information and sources, I did mention in the previous introductory video the websites that were going to be used as a starting point for this particular context that we're going to develop. So it's all about investing money. And the idea was to look at properties both domestically and internationally. The shares looking at both international and domestic options for shares and looking at the cash rates that are available for money to be invested as well. Cash rates are always going to be your lowest. So, the scenario that we're developing here is probably looking at other options other than cash specifically, but of course you could give a different pathway to your scenario based on the cash and other options that are available.

It's also probably important to remember at this stage that the task that I'm developing here is to give you a thought process of how this might actually come about. The task itself you would need to change in a significant way to make it unique and therefore usable as part of a school community. So that's always important to remember for tasks that are presented to you and how you might actually go and change them. So it certainly does give a wide base of change that is available and you would be able to see how this can actually develop as we go through.

So once we've identified our data sources which I think is one of your main ideas and focus points of any problem-solving, modelling, or application task, you then can start to develop questions around it. So the greatest questions I actually had in terms of this scenario, I wanted to know what would be classed as an acceptable return based on the current financial and economic climate.

If I was looking at overseas properties should I limit that to particular countries? Or should I actually go worldwide? In terms of the investment into property, am I thinking about a unit, apartment, a house? Maybe there's a commercial property, in industrial property, et cetera that I could put the money into in terms of domestically. Is there a state that I actually want to look at specifically? Would I currently use Victoria as the state? or would I go elsewhere? In terms of rental returns, what are they looking like in each of the capital cities? Are they different in rural areas? How can that impact in terms of the return on my investment as I go?

And in terms of shares, what sorts of shares should I be actually looking at? Am I going to go blue chip, industrial, commercial? What sorts of those shares are available for me?

So even in the scenario of questions that are already being set up you'd probably say that the development of any one of these or two or three would certainly be two to three hours. As I said, these were just a set of questions that were interesting in terms of the context. I do believe that if you were to develop each one of them, then you're talking about a problem-solving or modelling task that's far greater than the two to three hours that sit down for this particular task. So you really do have to limit what you're actually going to look at as you work your way through. But certainly there are enough questions there to go and develop the whole scenario as we work our way through.

The related analysis then I think is then self-explanatory. I can be investigating a home loan or a loan of any type including rate payments, depending on how I structured this the amortisation I can actually investigate. I can do this through graphs, tables. I can look at different time periods that are actually involved.

In terms of the shares. I may need to do a little bit of work on the share elements. I don't really think a day by day is going to work too well in terms of getting an overall view, particularly if it's a lengthy time period, we're talking about over a few years. So you might think about how you could summarise the share industry, the particular items that you've gone and purchased. I'm thinking of doing this per month. I'm trying to get an average across a month and use a percentage rate across the month whether that's an increase or a decrease, and then go and see what my share portfolio would be in terms of balances at the end of each month. Looking at the comparison of returns between units apartments houses, as I said, commercial properties if they come into it as well.

So as you can see, there's certainly a lot of related analysis to what we're actually looking at in the scenario that was already presented. The content particularly if I go to the study design is the idea of compounding interest that's coming up is the investment of compounding, reducing balance loans. I can certainly bring in the notion of recurrence relations.

Now, whether that's explicitly stated as part of a student's response where you can sit through a tabulation maybe it's explicit rules and we do need to be somewhat careful of directing them to particular approaches. Remember it is a problem-solving or modelling tasks. So their approach can actually be their choice. So trying to direct them sometimes is not the best way of going about trying to set up these particular scenarios.

Using tables to record the activities in the accounts. The amortisation idea using technology of course is a major part of this and how they actually go about using that technology would certainly be born out in the responses that they would actually be giving. So there is a vast array of content that we're actually looking at as part of this particular problem-solving modelling task, which is great. It's not everything, but no problem-solving or modelling should ever try and cover everything in the study design. Really the idea is we began this whole scenario was to come up with a context. That context will invariably lead you to content that's directly linked to the financial module. And therefore will emphasise the work that you've already been doing in a classroom, but on the picking specific elements of that particular content.

In terms of how this might look then as a question itself, I've started this off with a specific principal amount and time period. You may vary that. In terms of the scenarios there are a few parts, but the first one was to purchase the international property, whether that be a unit a house, an apartment, a commercial property and then looking at a home loan that would be available to allow that purchase to be made. How you might then look at that home loan over the period of time that this is being invested the four years. What rental money you could actually be getting back in, looking at the growth of house prices over that particular period of time, looking and then selling the house at the end of the four year period, and then how the investment had either grown or is depleted.

But the idea is to get growth coming out of these sorts of investments. So that would be a part A scenario. What you actually provide to them in terms of information would be the scaffolding that could actually come about. And then the parts that go on from there. I could be looking at the idea of a domestic property, maybe a portfolio of shares. You could decide how many shares actually want to come about, and then summarising all of the results that you've actually found from each of those questions. What they've actually found, what investments were good? What option was the most appealing? And to of course, analysing and giving reasons for why that particular option was better than all the others. So that particular information there gives you a scenario but remember, you can always scaffold some of these items.

In terms of their breadth of question at the moment, you may feel this is far too open for the students in your community. And therefore the scaffolding that then can come in is through the provision of more detailed information. I've given you a few options of the items that you might actually provide in this scenario. But one of the overriding elements of all of this is there has to be open-ended aspects which must be a feature of the actual task itself. So even if you do scaffold, then you need to be probably aware of just how much scaffolding and how much direction you're trying to give them. In terms of this scenario, mind you, you do want to limit how they go about the investment strategies and how they can work through the different scenarios? Remember, you're remembering you've already got the two to three hours to actually look at the scenario.

The content we would then map the content to these specific parts of the study design in terms of the first part. And I've just started a capital for you to be aware of what this process looks like. I've gone to the topic headers in the financial module component of the study design I've then looked at the dot points underneath them. And I've just started to map those dot points to the scenarios that we've set up in part one. And you'll notice there's two of them currently sitting on the screen and I would then go and do that for the rest of the dot points that are relevant. Of course you would build this in relation to this scenario you set up. So you could then see just how tightly the context or scenario you've created links into the study design and what it actually looks like. So that's the setup of part one the development of the task, the questions that are involved and then the mapping of the content itself.

So the next video that we will actually look at, will be the development of part two of this particular task. And then again, looking at the questions, the creation of content, what analysis, and then the mapping again. So in terms of the first part of this scenario that should give you some idea of the construct of the first part and I'll see you in a little while to continue the discussion. Thank you.

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