In this video 2, I will discuss how I have developed Parts 1 and 2 of the modelling and problem-solving task.

The following dot points are quite useful. Identify information and sources. State questions of interest and related analysis. Identify relevant content. An introduction of the context through specific cases or examples would be very helpful to get students started.

As this task is based on a real life scenario. Hence, I need to gather some real data such as: how big the Globe of Steel is. When the motorcycles are racing around inside the globe, What are the riders' speed? Will the combined weight of the rider and their motorcycle matter at all? How much would it be?

First of all, I want to ensure that students understand how the riders move around the globe. For example, what distance the riders would have covered once they have entered the globe and got to the equator of the globe. So I came up with a rule and tested this rule to ensure that it would work, of course.

The rule would provide students with some information about the size of the globe and the speed of the rider. I then checked the study design and selected some dot points relevant to the context of this task, mainly Calculus and Vectors. Just a little tip here that you don't want to include too much content in the task. So basically, you don't want to try to cover every dot point in the study design.

After I have identified the questions of interest which are related to the Calculus and Vectors areas of study, I started off by asking some routine context questions. Such as: Find the Cartesian equation of the path of the rider and graph this path. Find the velocity, the distance as a function of time, their speed and the net force acting on the rider as you can see in parts a to d in this Part 1.

So, in summary, Part 1 is an opportunity for students to learn or gather information about a scenario that after the rider enters the Globe of Steel and moves towards the equator.

Now onto Part 2, I now moved to an alternative scenario where the rider has reached the equator of the Globe of Steel. And then instantly proceeded to ride around the equator. Again, I came up with a rule to model this scenario. This rule will help students to come up with their own model in Part 3 which I will discuss in my next video.

So basically, this rule is modelling the rider rides around the equator, which is a circular path and it is 2.5 metres above the ground. And I asked similar questions to the ones in Part 1. So you can see, find the vector equations for the velocity and acceleration of the rider at time t and describe the motion of the rider. Calculate the rider's speed and the distance the rider has covered after a 2-minute stunt. So how many loops has the rider made in these 2 minutes? Some background, some questions that would help them to be able to come to their Part 3. So this is to guide students through the context of the real world applications. And as I mentioned before, which will help them in Part 3.

Now I would like to talk about another possible question. Which is not quite on the course, but it makes sense to ask this - in this scenario, is the centripetal force. As you can see on the slide, that I have included all the rules to help students work out the centripetal force. I think it will benefit the students to actually get them to watch an introduction to centripetal force video before the SAC.

You might think at this stage that there are no open-ended questions or students' aspect. Well, remember the first two parts are an introduction of the context through specific cases or examples. So, at this stage, the first two parts and maybe one part, depends on how you would like to write, were actually designed as a series of questions which is totally appropriate as a means of guiding students through an exploration of the modelling context or problem to which it will be done in Part 3.

Now to finish off Parts 1 and 2, we can look at indicative content. So the topics I'm covering in these tasks are Vector Calculus and Calculus. With specific dot points from the study design such as: sketching the corresponding path given r in Cartesian or parametric forms, et cetera. It means that's the end of Video 2. In Video 3, I will discuss how I have developed Part 3 of the modelling and problem-solving task.

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