Hello, I'm Trang Pham, an experienced teacher of Specialist Mathematics. In this set of videos I will show you how a modelling or problem-solving task and corresponding assessment scheme can be developed.

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In this PowerPoint presentation, I would discuss the process of how I have developed a modelling or problem-solving task. The purpose of the modelling or problem-solving task is for students to develop or explore a model for a particular scenario, or solve a problem, or a set of related problems in some depth that involves the Calculus and Vectors areas of study in real life context.

So for example, these situations or scenarios could involve: motion in a space station, or of a plane, a boat that curves around a path. Aerial skiing, skateboarding, boomerang, roller coaster, car racing, a bobsled track at the 1994 Olympics in Norway. I will leave the next few slides for you to read through in your own time. These slides provide some very useful information about the modelling or problem-solving tasks such as, what it is.

A framework from the International Mathematical Modelling Challenge to which you might like to share with your students, a flow chart diagram showing the nature of the modelling or problem-solving process. Just a friendly reminder that a modelling or problem-solving task is to be up of two to three hours duration over a continuous period of one week. The structure of a modelling or problem-solving task. And four very useful steps that I've followed to develop this modelling or problem-solving task.

Now, I will share with you how the context was chosen and what inspired me to write up this task. I love travelling. And in one of my overseas trips, I was lucky enough to watch an amazing circus and carnival stunt, where stunt riders ride motorcycles inside a mesh sphere ball accompanied by dramatic music, sweeping lights, and occasional sparklers. I later learned this sphere ball is called a Globe of Death, Sphere of Fear or Globe of Steel. It requires only three things. A big metal globe or a mesh sphere, a motorcycle, and a very skillful rider. I enjoyed watching the show very much, but I can share with you the whole time I thought my heart was in my mouth.

So, there's my task title: Globe of Steel. I wrote a brief introduction to provide some background of the Globe of Steel which helps students to understand what it is. I did some research and found some great photos, which I included in the task with some annotations such as where the equator is, how the riders and the bikes, enter and exit the globe, and the rider's initial position. I also included a statement to explain a vector coordinate system in three dimensions.

I think it would be a great idea to get students to watch a video clip on the Globe of Steel before the SAC, just to give students some enjoyment of how we bring maths into a real life scenario, as well as for them to know what the Globe of Steel is. There are plenty of ultimate daredevil YouTube videos in which several of the world's best dirt bike riders defy gravity, looping around the globe in all kinds of different directions, not just one rider, but three, or five, or even eight riders.

Students could also do a bit of research to understand how a Globe of Steel works. So that's the end of video one. In video two, I will discuss how I have developed Parts 1 and 2 of the modelling and problem-solving task.

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