Rationale

I am trying to make a computer program which is a demonstration of computer algorithms being used to to simulate 3D physics and graphics. This will take the format of a realtime demonstration of around 2 minutes in length, similar to a video but where each frame is calculated from scratch by my program. I want to make something where the process of creation is a technically challenging experience for me, but the outcome is presented as a visual demonstration which can be appreciated and enjoyed by everyone.

Through this Extended Project I will get the chance to explore and experiment with two fields of computer science (computational graphics and physics) that I have not previously had any experience in. Additionally, I will get to put to use some of the tools that I have learnt about in the A2 mathematics course, such as force and motion calculations, vectors and matrices. I will also learn about the artistic side of making a 3D animation visually appealing.

I do a lot of programming in my free time, so I think that this is a good way to see how far I can stretch my programming ability. I did not choose Computing as one of my A-level subjects, however I would like to go on and study Computer Science at university. This project will allow me to continue to practice my programming skills, making up for the fact that I do not get to do so in any of the subjects that I am taking this year. Although this project supports my interests and career choice, there are also many other skills required to successfully complete it, and working on the project will push me out of my comfort zone and in the process broaden my horizons.

There is plenty of information related to the project that I have chosen, and my primary source of information will be the internet. The "demoscene" is comprised of programmers who demonstrate their ability through visual demos similar to the one that I am attempting, but on a larger scale. Information on the techniques that are used in such demos is scattered across the internet in the form of blog posts, PDFs, and posts in discussion forums. Some of the techniques are presented at conferences, and I will make use of videos and slides from talks that are relevant. I will also be looking for books on this topic if I cannot find the information I need on the internet.