Criterion A: Planning

Client, Dr Karamath is a physics teacher at my school. He finds it difficult to demonstrate with simulation how gravity attraction field strength work in their Y12 IB class. For them it is important for their student to fully understand the topic to pass the exam successfully.

After consulting with the client (See Appendix), I suggested to make a 2D educational solar system simulation based on physics equations related to the topic in the curriculum. Learning the topic while using the simulation will greatly increase student understanding of the topic, because it is more interactive.

I have tried to research similar products online; however, I have only found one programme which is similar to my idea "Universe sandbox" which is a very heavy program. My program is a lightweight 2D program, which will not waste class time for loading the program. I have experience in working with JavaScript, CSS, HTML, and I know that it is perfect fit for this project as I will be able to upload it on the internet for Dr Karamath's class later. This project will be done with JavaScript, CSS, HTML programing languages.

Rational

The program "Gravity Simulator" will be our solar system-based program, where client will be able to create and delete planets, asteroids, and satellites in our solar system, and see how the trajectory and gravitational field strength works. The program diversifies itself from other solar system simulations with an ability to freely create asteroids, planets, and satellites anywhere in solar system, and input its stats. The trajectory of bodies will vary due to Gravitational equations based gravitational fields of planets and asteroids. It is the best solution because the program is 2D, and it provides the client ability to show students how the gravitational field

strength works, and how the trajectory of celestial bodies can vary due to the gravitational strength without loading heavy programs. It will also include a user-friendly simple GUI where Dr Karamath's students will be able to use the program even if unexperienced with similar type of programs. JavaScript will be used to code this program.

Success Criteria

The success criteria of my project – program should:

1)	GUI (simple; user-friendly)
2)	Ability to add planets
3)	Ability to add Satellites
4)	Ability to edit celestial body stats
5)	Have option for Standard, Scientific forms, and AU (Astronomical Unit) form
6)	Ability to start and stop the simulation
7)	Ability to change camera perspective
8)	Scroll in and out of the solar system to magnify the size
9)	Ability to create asteroids
10)	Real life and in simulation time comparison

Word Count: 436