



Please consider all of the provided essay topics.

ENERGY & INNOVATION



1. Given the extreme conditions on Mars and the challenge of travelling there, how realistic is Mars colonization?
2. With the rising demand for clean energy, innovative solutions have emerged. Countries such as China, Singapore, and Indonesia have been investing in floating solar farms on water. Discuss the advantages and disadvantages of floating solar panels, known as "floatovoltaics," as an alternative to land-based solar installations.
3. What are the challenges in storing energy from renewable sources? Consider hydrogen generation as an option.
4. The first direct detection of gravitational waves was made on September 14th 2015 by the LIGO collaboration. Discuss the nature and detection of gravitational waves and their importance to science.
5. How does diversity contribute to successful design and innovation? Discuss specific examples where a lack of diversity in design teams has led to product failures or a compromise in safety.
6. The rise of AI & virtual reality: How will it shape education and entertainment?

MEDICINE & PSYCHOLOGY



1. Discuss the potential contribution of AI to the future development of medicines and/or diagnostic testing.
2. Data suggests that the amount of time people spend with friends in person has decreased from 30 hours to 10 hours per month. What impact might this decline have on a person's well-being and what can be done to foster social connections in an increasingly digital world?
3. The gut-brain axis is a physical connection between the digestive system and the central nervous system. Discuss how the gut-brain axis influences the human body in health and disease.
4. Ozempic (semaglutide), a GLP-1 receptor agonist, is prescribed for type 2 diabetes to regulate blood sugar, slow digestion, and suppress appetite. Recently, it has gained popularity as a weight loss aid among non-diabetic users by reducing hunger and calorie intake. Discuss.
5. It is widely recognised that art and music have a role in maintaining and/or improving health. Discuss the physiological processes involved.
6. The People's Palace opened in 1898 to serve as a cultural centre for Glasgow's East End, a historically unhealthy and overcrowded area. It exemplifies how urban green spaces offer health benefits through recreation, education and social interaction. Discuss how green spaces can still be utilised to reduce the risk of non-communicable diseases.

CHEMISTRY & BIOLOGICAL SCIENCES



1. Evaluate the effectiveness of Marine Protected Areas (MPAs) in conserving marine biodiversity and ecosystems. Discuss the advantages and disadvantages of MPAs, providing examples to support your arguments.
2. While the principle of lower emissions from electric vehicles is commendable, is this negated by the environmental cost of mining the lithium, cobalt and nickel required to make the batteries as well as the carbon footprint of transporting the batteries to car manufacturers around the World?
3. How do vehicle tyres contribute to the level of microplastics being released into the environment and what can we do to reduce it? As Electric vehicles are heavier than those with an internal combustion engine also consider how this may impact on the generation of micro plastics.
4. Can synthetic chemistry create sustainable food sources for a growing population?
5. How does regeneration & rewilding of marshlands contribute to carbon capture and flood prevention? Include examples.
6. Our waterways are increasingly at risk from pollution. What are the challenges facing the biodiversity of our waterways and what possible solutions are available?