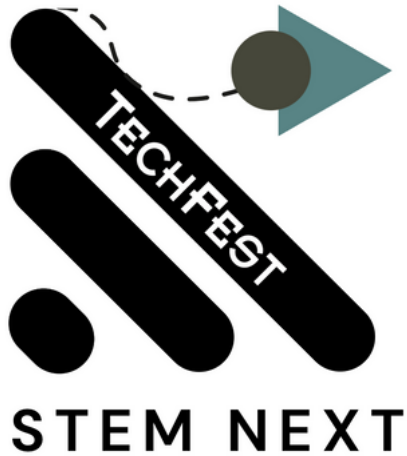


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Please consider all of the provided essay topics.

ENERGY IN ACTION



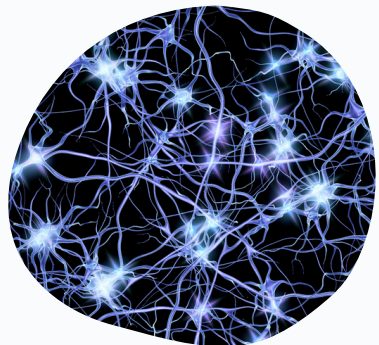
1. Emissions originating from transport such as planes, trains and cars are decreasing. However the transport emissions related to vans making online home deliveries are increasing. Is your cheap/quick online shopping delivery worth the associated environmental impact? Discuss.
2. What does a net-zero world look like: How does life need to change and how do we make it happen?
3. On April 2019 the first image of a black hole was published, generating a great deal of interest in the scientific community and capturing the interest of the general public. What is a black hole? Why is it so difficult to image them? How was this finally achieved?
4. How can hydrogen help with the energy crisis?
5. Carbon capture technologies have been promoted as a green solution but are energy intensive. Discuss the pros and cons of these technologies.
6. Professor Peter Higgs passed away on 8 April 2024. In 2013, along with Francois Englert, he was awarded the Nobel Prize for Physics for research that predicted the existence of a particle which came to be known as the Higgs boson. The existence of this particle was confirmed at the Large Hadron Collider in 2012. What is the Higgs boson and why was its discovery so important?

MEDICINE & LIFE SCIENCES



1. The process of transplanting genetically edited organs from animals to humans is an emerging technology. Discuss the ethics of this process, e.g. is the welfare of a pig more important than the survival of a human?
2. The birth rates in some countries are decreasing. Among the possible explanations for this observation, it has been suggested that lack of in-person interaction among young people or the changing personal choices of people of childbearing age are contributing factors. Discuss these and other potential explanations.
3. Wearable medical technology has developed rapidly over recent years. Discuss the benefits that this brings to patients who live with chronic disease e.g. diabetes
4. Photo editing of images and videos within social media, including the use of filters, is widespread. As a result, content shown on social media may be a distortion of reality. Viewers of these images may confuse reality with these manipulated images to the detriment of their own self-image and self-confidence. Discuss the impact of this type of digital manipulation on the body image and self-confidence of people.
5. Artificial Intelligence (AI) has developed rapidly in recent years and it is becoming a useful tool in many STEM endeavours. One of these is medical imaging, in which images obtained from modalities such as CT, MR, PET etc are used for diagnosis of disease and in the direction of treatment. Discuss the use of AI in this context, highlighting the advantages and possible disadvantages of this application.
6. What emerging medical technologies/treatments are available to deal with mental health issues?

CHEMISTRY & BIOLOGICAL SCIENCES



1. There is still a huge STEM skills gap, i.e. not enough people are choosing to learn and work in STEM fields. What do you think could be done to rectify this situation?
2. How do opioids work? Discuss the risks and benefits associated with this group of drugs.
3. It's been suggested that extreme weather events are occurring more frequently across the globe in recent years. Discuss these events, the mechanisms involved in such events, the communities that are at risk of being affected and possible mitigations of these risks.
4. Plastic pollution is a concern due to the time it takes for plastics to break down in the environment. Investigate the role of living organisms, including fungi and bacteria, in breaking down complex compounds in biology, and how this can be utilised for breaking down plastics.
5. Discuss the challenges and opportunities available to ensure that food production is environmentally sustainable whilst providing access to adequate nourishment for the world's population.
6. Highlight the ways in which hormonal imbalance impacts people's physical and/or emotional well-being and discuss possible remedies and solutions designed to restore the balance.