Conyers Sixth Form Transition Work

A Level Chemistry

Congratulations on your enrolment to Conyers Sixth Form; please find below, tasks that will aid your transition from GCSE to Level 3 study. Your subject teacher will check completion of this work in September.

1. Watch the following video - Explosive chemistry - with Andrew Szydlo Note down the things that surprised you! Write down what type of chemical reactions took place.
   https://www.youtube.com/watch?v=uswf_8Ch39s

2. Read the article on Chemistry World and write down how chemists are finding new innovative ways to make drinking water safe
   https://www.chemistryworld.com/features/the-chemists-dedicated-to-making-drinking-water-safer/4019193.article

3. Read the article on blue and green hydrogen and then research how Teesside is going to be using blue and green hydrogen in the future. (Separate document)

Year 11 into 12 Transition work

A-level Chemistry

A-level Chemistry Transition work

In preparation for September, the Chemistry department at Conyers have devised three tasks to get your brains thinking again. Please work through the tasks below and bring your answers to your first Chemistry lesson; with the intention of discussing what you have found out.

Any questions please email Mrs Small: vsmall@conyers.org.uk

- **Task 1:** Explosive chemistry - with Andrew Szydlo

Watch the video link and note down the things that surprised you! https://www.youtube.com/watch?v=uswf_8Ch39s

- **Task 2:** Making water safe to drink

Read the article on **Chemistry World** and note down how chemists are finding new innovative ways to make drinking water safe

https://www.chemistryworld.com/features/the-chemists-dedicated-to-making-drinking-water-safer/4019193.article

- **Task 3**: Green and blue hydrogen (next slide)

Read the article and then research how Teesside is going to be using blue and green hydrogen in the future

Green and Blue Hydrogen: Paving the Path to Sustainable Energy

Vidushi Saxena • July 2, 2024

2 minutes read

Hydrogen has been identified as one of the most viable solutions as the world looks for ways to reduce the effects of climate change and shift to cleaner sources of energy. Green and blue hydrogen are two forms of hydrogen that present different routes to a decarbonized world. It is important to assess their functions in global sustainability, and therefore, it is necessary to comprehend their production processes and advantages and disadvantages.

Green Hydrogen: The Clean Energy Champion

Green hydrogen is generated from water using electricity from renewable sources like wind, solar, or hydroelectric power. The generated hydrogen gas is completely carbonless, and therefore, green hydrogen is a key component of any green energy plans.

Advantages

- **Zero Emissions:** Green hydrogen production is achieved through the use of renewable energy hence it has no carbon footprint, which is a plus for climate change.
- **Energy Storage:** Green hydrogen can help to store the excess renewable energy and thus match the supply and demand in the energy grid.
- **Versatility:** It can be used in transport, industry and heating and thus is a versatile energy carrier.

Challenges:

- **High Costs:** The current cost of green hydrogen is still higher than that of fossil fuel based methods because renewable energy and electrolysis technology is costly.
- **Infrastructure:** There is a need for capital investment to establish the facilities for generation, storage, and transportation of green hydrogen.

Blue Hydrogen: A Transitional Solution

Blue hydrogen is generated from methane through steam methane reforming (SMR) with the added feature of carbon capture and storage (CCS). Blue hydrogen is not completely carbon-free but it is a cleaner source of energy compared to the conventional black and brown hydrogen.

Advantages

- **Reduced Emissions:** Blue hydrogen involves capturing and storing the CO2 produced during the generation of hydrogen, which makes it less damaging to the environment than other processes.
- **Cost-Effectiveness:** Blue hydrogen is more cost-effective than green hydrogen at the moment since it uses the existing natural gas pipeline.
- **Scalability:** The existing natural gas industry can be easily transitioned to blue hydrogen production, which will help in the faster transition to a lower carbon economy.

Challenges

Carbon Capture Efficiency: CCS technology is not 100% effective, and there is still a possibility that some amount of carbon will be released into the atmosphere.

Fossil Fuel Dependency: Blue hydrogen uses natural gas which is a fossil fuel and therefore it is not completely free from the negative effects that are associated with fossil fuels.

Sustainability and the Future of Hydrogen

While green hydrogen is a key component of the energy transition, blue hydrogen is also important for the same. Green hydrogen is the ultimate goal of a fully renewable and emission-free energy source for the future. But until the costs come down and infrastructure is developed, blue hydrogen acts as a transition technology, allowing for emissions to be cut in the short term while renewable technologies are developed.

Strategic Integration

Policy Support: To ensure green hydrogen becomes competitive with blue hydrogen, governments must offer subsidies and incentives to close the cost gap and support investment in infrastructure.

Research and Development: Further advancements in electrolysis technology, renewable energy, and CCS will make both hydrogen types more economically feasible.

Public and Private Partnerships: The role of the public and private sectors in the development of hydrogen technologies and infrastructure can be complementary.

When you have read the article research how Teesside is going to be using blue and green hydrogen