Y10 Project/Challenge Work - Summer Term 1

Alongside your ongoing work on Seneca, to help you revise the work covered in Year 9 and 10 and/or to prepare for the work we will cover in Year 11, we would like you to work on the following three projects/challenges. If you can, try to spend roughly 4 hours per week on Science (6 for Triple). There are also lots of extra ideas on <https://www.rigb.org/ExpeRimental> for you to try if you like. We look forward to seeing and discussing your work, when we return to school 😊

We have split these into Combined (foundation), Combined (higher) and Triple Science. Please go to the appropriate section below:

**Combined Science (foundation):**

**Biology** –

Your task is to create a presentation on the following:

You should pick 3 communicable diseases (one could be Coronavirus) and research the following for each:

* The pathogen that causes it with a description/images
* How the pathogen is spread
* Symptoms, prevention and treatments
* Global trends of infection

**Chemistry** –

1). Various challenges on the BP website:

To access this resource:

* - open the BPES website: bp.com/bpes
* - click on 'Enter a student code' (top right on all pages if you are not logged in)
* - enter the student code below

*Periodic Table Challenge: 53535* (a fun way to explore (and revise!) the Periodic Table)

2). For a fun way to revise our Acids and Alkalis work, try <https://www.rigb.org/families/experimental/series-2/cabbage-indicator> and have a go yourself!

**Physics** – Research radioactivity. Prepare a presentation that enables you to explain the key parts in Radioactivity to the people around you. Start by explaining the atom and its structure and then go on to say what radioactivity actually is. Explain Alpha, Beta and Gamma. Refer to Half-life and the ways in which background radiation can be checked. Finally explain the dangers and use of radioactivity and refer to examples where use of radiation may lead to dangers for the public e.g Chernobyl..

**Combined Science (higher):**

**Biology** –

Your task is to create a presentation on the following:

You should pick 3 communicable diseases (one could be Coronavirus) and research the following for each:

* The pathogen that causes it with a description/images
* How the pathogen is spread
* Symptoms, prevention and treatments
* Global trends of infection and possible reasons for differences between countries e.g. social and economical aspects
* Once you have detailed the diseases, you can compare these diseases by the types of pathogen, how the infection spreads, prevalence of the disease etc.

Extension task – choose 2 non-communicable diseases and research into causes, symptoms and treatments and evaluate the effectiveness of these treatments.

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2). <http://www.rsc.org/learn-chemistry/resources/screen-experiment/titration/experiment/2>

This is great for revision of Acids and Alkalis. Click on Quickstart (unless you want to register) and then work through the videos and information. I’m sure it will bring back happy memories of the Titration practicals we did 😊

3). For some higher-level thinking and learning!

STUDENT ACCESS Url: <https://student.pasco.com>

Essential Chemistry Access Code: NGSS58653-EC1-SB-0720-25XBT

Click on ‘Interactives’ and have a go at:

* The ‘converting units’ simulator
* Temperature and Heat – have a look at the simulators and accompanying notes

Click on ‘Problems’ and work through the homework quizzes. Stick to work we have covered for now eg:

* Temperature and Heat
* Atomic Structure
* Acids and Bases

Then feel free to have an explore on the topics we will be looking at next:

* Electrochemistry
* Equilibrium

**Physics** – Research Radioactivity. Prepare a presentation that enables you to explain the key parts in Radioactivity to the people around you. Explain the structure of the Atom, include the different models. Explain what Radioactivity actually is. What are Gamma, Beta and Alpha radiation? Compare and contrast the different types of radiation. Describe all the different sources of Background radiation and how this can be checked. What is Half-life, think about the shape of graph you might see and how it can be modelled using dice and the other method with water flowing through a biuret. Finally explain uses and dangers of radioactivity and give examples. E.g Chernobyl.

**Triple Science:**

**Biology** –

1. Research the structure and functions of the eye. How does this link to identifying a stimulus in the nervous system? Further this work by explaining how concaved and convex lenses work. Use diagrams to support your research. BBC bitesize and revision guides will help with getting the information.
2. Use the following link to help with revision on photosynthesis and uses of glucose. Use the quizzes to test your knowledge. <https://www.thenational.academy/online-classroom/year-10/science/#subjects>
3. Inheritance is a key subject in Paper 1. Please revisit this topic so that you understand the keywords involved. Make a keywords glossary and diagrams of Punnett squares and family pedigrees. Use this link to help <https://www.bbc.co.uk/bitesize/guides/z2rm3k7/revision/4>

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*Polymers for Life: 59672* (lots of new information on the world of Polymers (a Triple-only unit in Y11 😉)

*Crude Oil: 12571* (Using your skills to refine Crude Oil, revisiting work on Pure/Impure substances, and gaining new knowledge (ready for Y11!) on Crude Oil and its’ Fractions)

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* The ‘converting units’ simulator
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Click on ‘Problems’ and work through the homework quizzes. Stick to work we have covered for now eg:

* Temperature and Heat
* Moles
* Stoichiometry
* Atomic Structure
* Acids and Bases
* Electrochemistry

Then feel free to have an explore on the topics we will be looking at next (and any others that catch your interest!):

* Equilibrium (in more detail than we have done so far)
* Reaction Rates

**Physics** – Research all the key areas from Waves and the Electromagnetic Spectrum. Prepare a Power-point to share with your friends and family. Look at describing waves and how you calculate wave speeds. Think about the ripple tank practical. Study refraction and how waves cross boundaries. Describe the way we hear sounds and explain both Ultrasound and Infrasound. Show how you draw ray diagrams and explain TIR. Explain why we see different colours. Show your understanding of different types of lenses and the way that images are created. Explain all the parts of the electromagnetic spectrum and how the different parts of this are used. Explain radiation and temperature and what the core practical linked to this shows. Finally explain the dangers of the electromagnetic spectrum.