Y8 Project Work - Summer Term 2

Further to the work you have done in Summer Term 1 and to help you prepare for Year 9, we would like you to work on the following three projects. **If you completed these as the extension tasks in Summer Term 1, then there are some further extension tasks on page 2 for you to complete**. If you can, try to spend roughly 3 hours per week on Science. We look forward to seeing your work when we return to school 😊

Biology – Respiration

Investigate the effect of exercise on the rate of respiration. Draw a table to collect data of your heart rate (in beats per minute) before and immediately after different types of exercise. Measure your heart rate by counting your pulse rate for 1 minute. Make a conclusion of your results, what happens to your heart rate after exercise? Why do you think this happens? What happens to your breathing rate? Why do you think this happens?

Chemistry – The Earth and Atmosphere

Produce an information leaflet on the above. Which gases make up the Earth’s Atmosphere? What are the quantities of these gases? Can you find out about any uses for these as separate gases too? How do scientists prove the volume of oxygen in the air? What is the chemical test for oxygen and for carbon dioxide? You could then research the atmospheres of other planets. How do they compare?

Physics – Ping Pong Ball Blaster Investigation

How does the volume of water affect the height that the ball bounces to?

***What you'll need:***

* A ping pong ball (0r try other balls, power balls etc), any kind will do.
* An empty plastic yogurt or fruit cup
* Water- you'll probably want a bucket full so you can do this over and over again!
* A good place to to blast off, preferably outside or in your bath tub (if it has a flat bottom) because you will probably splash a lot of water. Asphault or concrete is fine, but, surprisingly, grass usually works just as well, and you'll be less likely to crack your cup from hitting a hard surface.

Method

1. Bounce your ball by dropping it above the surface without it in the cup.
2. Fill the cup about half full and swirl the water around gently, so that the ball stays in the centre of the cup and comes out more cleanly.
3. Drop the cup and observe how high it goes.
4. Now alter the volumes of water and try 5 different volumes.
5. Enjoy investigating.
6. Now see if you can explain why the ball bounces to different heights when in water.

Remember those key variables: independent, dependent and control.

Write it up with the appropriate sections: Planning, Results, Conclusion and Evaluation.

Now have a go at changing the independent variable to a different one. Investigate this.

**Optional Extras!!**

Biology – Evolution and Darwin

What is Evolution and what evidence is there to support it? Keywords include Natural Selection, Adaptations, survival of the fittest and inheritance. <https://www.bbc.co.uk/bitesize/guides/zw9jq6f/revision/1>

Research Darwin’s life. Who was he? What did he do? Why did sail on the HMS Beagle? Fun facts about Darwin. <https://www.youtube.com/watch?v=BcpB_986wyk>

Produce an information sheet to bring with you when we return to school.

Chemistry – The Earth and Atmosphere

Research how the Earths atmosphere has changed since the Earth formed. Which gases used to be in high concentration? How do scientists know this? How have the concentrations changed and what has caused this change? <https://www.bbc.co.uk/bitesize/guides/zysbgk7/revision/2> is a good place to start and also has links to: Revisit the Rock Cycle (from your Geography lessons, or research this too!) How is this linked to the Earth’s Atmosphere? Can you produce a model to teach the Rock Cycle to a family member? What is crude oil? Where does it come from? How is it extracted and made into useful products? What do we use it for? Produce a fact sheet for you to keep and use when we revisit this in the future.

Physics – Electricity and Magnetism Project

This project is split into 6 parts, you will need to complete 1 part, each week, over the next 6 weeks. For each section complete at least a page in your exercise book of the key ideas you have discovered.

Part 1 – The History of Electricity - <https://www.youtube.com/watch?v=hVu844ZcCdU> – Key points to think about: Who was Humphrey Davy? What was an Electrician? Watch the first 30 minutes of this and describe in your own words the first discoveries made into electricity.

Part 2 – Static Electricity – Dancing paper – Perform an ‘Electrician’ type demonstration getting tissue paper to dance. Remember you will need a plastic rod or ruler and a cloth or piece of kitchen Roll and some tissue paper. Perform this and explain it to your family and/or friends.

Part 3 – Household Electricity – Do a survey of the number of sockets in your house. How many pieces of electrical equipment are in your house? Find out the power of 10 pieces of equipment in your home and then rate them from the most powerful through to the least powerful.

Part 4 – The Source of Electricity. Research how the electricity that you use is made. How does it get to your home? Draw a flow diagram to show how the initial source of energy is transferred eventually into electricity in your home. E.g Light energy from the Sun > Photosynthesis in plants > Plants are crushed under soil over millions of years > Fossilized plants form coal > Coal is dug up and burnt > etc .

Part 5 – Magnets and Electricity. What materials are magnetic? What is a magnetic field? How can you use a magnet and a wire to make electricity? Research all these key ideas and complete a page of notes with as many ideas as you discover on how magnets and electricity are connected.

Part 6 – The advantages and disadvantages of Discovering Electricity. For the most part the discovery of electricity has been very positive for humankind. Now look at all the advantages and the disadvantages of discovering electricity and draw a page of positives and a page of negatives to think about these.

To help in your research you may wish to look again at the Seneca units on Electricity and Magnetism and BBC Bitesize KS3 Physics – What is domestic energy?; Energy in the Home; What is electricity?; Static Electricity; How to generate Electricity and Electromagnetism and Magnetism.