Applied Science Transition Pack

Applied Science Research Task

As part of your course you will complete a practical assessment. This will require you to carry out a series of practical activities as well as planning how to do them, analysing the results and evaluating the methods. This will require you to: Using appropriate apparatus to record a range of measurements (such as acceleration, rate of reaction, mass, volume and concentration), the use of an eyepiece graticule and stage micrometer to investigate various samples with a microscope, the use of a haemocytometer and Coulter counter to investigate cells, the use of quadrats, the use of titration apparatus to investigate acid-base reactions, the use of a potentiometer to investigate potential divider circuits, the use of light gates to investigate the acceleration due to gravity. Using techniques such as scientific drawing, estimation of plant cover, continuous monitoring methods.

Please complete the following research questions based on and around the areas of practical assessment:

Research questions based on investigative criteria:

Research the following investigative terms:

Haemocytometer

Potentiometer

Eyepiece graticule

Coulter counter

Quadrat

Titration

Research based on investigations you will do:

Biology

- What subcellular structures can be found in animal and plant cells? What are their functions?

- What is an ecosystem, and what are the main components that make it up?

- How do biotic (living) and abiotic (non-living) factors interact in an ecosystem?

- How does energy flow through an ecosystem, and why does the amount of energy decrease at each trophic level?

Chemistry

- How are acid-base titrations used in the wider industry (e.g., medicine, food, environmental science)?

- How does titration help in testing the acidity of substances like vinegar or lemon juice?

- Why is controlling pH important in industries like agriculture, water treatment, and healthcare?

- Please produce a poster on the different factors that can affect rate of reaction. Please include collision theory and, if applicable, activation energy

Physics

- What is a potential divider? Where are potential dividers used in everyday objects? Why are they used?

- How does the acceleration due to gravity differ on the Moon, Mars, and other planets?

- Why does the value of gravity change slightly depending on where you are on Earth (e.g. at the poles vs. the equator)?