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**Knowledge Rich Curriculum Plan**

BTEC – Unit 2 Learning Aim C



| **Lesson/Learning Sequence** | **Intended Knowledge:**  *Students will know that…* | **Prior Knowledge:**  *In order to know this, students need to already know that…* | **Working Scientifically** | **Tiered Vocabulary and Reading Activity** | **Assessment** | **Support** |
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| **Lesson 1:**  **Introduction to Chromatography** | Students will know how to define soluble to be a substance that does dissolve, Insoluble is a substance that does not dissolve, Solvent is the liquid that the solute dissolves into (mobile phase), Solute is the solid that is dissolved into the solvent. Solution is when a solute has been dissolved in a solvent. Students will know that a component is part of a mixture. The Chromatography paper is the stationary phase; the phase that does not move. Students will recall the process of paper chromatography to be;   1. Draw a straight line 2cm from the bottom of the chromatography paper in pencil 2. Place one dot of liquid mixture on the pencil line 3. Place 1cm of solvent into the beaker 4. Place the chromatography paper into the solvent 5. Remove chromatography paper when the separation has stopped and draw another pencil line. 6. Calculate the rf values using the equation; distance moved by component/distance moved by the solvent. | Students will recall the process of performing a paper chromatography experiment as it is a require practical for GCSE AQA. | Enquiry: Students will be able to perform a practical making amendment to their technique to achieve more accurate results  Analyse: Students will be able to analyse their data collected by calculating the rf values and comparing them with known component values. | Component  Soluble  Solubility  Insoluble  Stationary  Mobile  Solution | Completion of assignment brief. | E- books on student drive  Lesson resources on teams  Class booklets  Teacher feedback |
| **Lesson 2: Plant pigment chromatography** | Student will know how to perform a paper chromatography on spinach to extract the plant pigments using different solvents; iso-propyl-propanol, ethanol, acetone. Students will recall how to calculate the rf values of the different pigments in plants leaves. | Students will already know the process of performing a paper chromatography experiment and how to calculate the rf values of different components on a chromatogram. | Analyse: Students will be able to compare their successes from the first chromatography practical with the second. | Pigments  Extract | Completion of assignment brief. | E- books on student drive  Lesson resources on teams  Class booklets  Teacher feedback |
| **Lesson 3: TLC** | Students will know how to define absorption is the process in which atoms (adhere to) to a surface of the absorbent. Students will know the differences between thin layer chromatography (TLC) and paper chromatography to be; the use of capillary tubes to move a small amount of sample, covering the beaker to ensure that the solvent does not evaporate, the use of silica gel/alumina coated onto a piece of glass so that the components can adsorb onto the surface better that paper. Students will know that the definition of polarity is a separation of electric charge leading to a molecule or its chemical groups having an electric dipole moment, with a negatively charged end and a positively charged end. Students will know the that adsorption of a component onto the surface of the TLC plate is dependent on the polarity, the less polar the component, the higher the component will travel. Students will perform a TLC practical. | Students will be able to calculate rf values and the method used to perform a paper chromatography experiment. | Communicate: Students will be able to construct an explanation of how TLC is different to paper chromatography. | Thin-layer chromatography  Adhere  Polarity | Completion of assignment brief. | E- books on student drive  Lesson resources on teams  Class booklets  Teacher feedback |
| **Lesson 4: Chromatography Theory** | Students will know that the definition of affinity is the degree to which a substance tends to combine with another.Students will know that TLC as a forensic science technique is used because it is low cost, simple, high sensitivity and speed. Students will know that a compound will have different affinities for the mobile and stationary phases, and this affects the speed at which it travels. The goal of TLC is to obtain well defined, well separated spots. Students will know that when comparing two different compounds under the same conditions, the compound with the larger Rf value is less polar because it does not stick to the stationary phase as long as the polar compound, which would have a lower Rf value. Students will know that the reproducibility and rf values can be affected by a number of different factors such as;   * layer thickness * moisture on the TLC plate * vessel saturation * Temperature * depth of mobile phase * nature of the TLC plate, * sample size, * solvent parameters.   These effects normally cause an increase in Rf values. | Students will already know how to perform thin-layer chromatography and the definition of polarity. Students will know how to calculate the rf values of different components on a chromatogram. | Communicate: Students will be able to construct an explanation of the problems associated with using TLC as a forensic science technique. | Affinity  Goal  Sensitivity  Speed  Polar  Non-polar  Parameters  Nature  Depth  Solvent | Completion of assignment brief. | E- books on student drive  Lesson resources on teams  Class booklets  Teacher feedback |
| **Lesson 5: Assignment Write up** | * Completion of assignment booklet and assignment brief (provided by Pearson) write up, using the intended knowledge gained from previous lessons. | * Method of practical | Communicate  Construct conclusions, critic method and suggest improvements. | Conclusion – a judgement or decision reached by reasoning.  Analyse – examine methodically and in detail.  Evaluate – judge the quality, importance and value of something.  Critique – a detailed analysis and assessment of something. | Completion of assignment brief. | E- books on student drive  Lesson resources on teams  Class booklets  Teacher feedback |