



Bilton School Sixth Form

Applied Science – Transition Work

BTEC Mini Assignment Brief

Qualification	Pearson BTEC Level 3 National in Applied Science (Extended Certificate)
Unit number and title	Unit 4: Practical Procedures and Techniques
Learning aim	A3 Determination of purity of compounds A4 Evaluating accuracy and reliability using critical thinking
Assignment title	Analytical Techniques
Assessor	C. Burchett
Issue date	2 nd July 2025
Hand in deadline	First Applied Science lesson in September 2025

Vocational Scenario or Context	You are a trainee laboratory technician in a food and consumer goods lab that receives samples from food manufacturing companies around the world. Various analytical techniques are carried out there including titrations, colourimetry, calorimetry, gas chromatography, thin-layer chromatography and paper chromatography to understand the chemical make-up of their products better, including to check if there are any banned or harmful chemicals in them.
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Task	<p>Use your transition day results and carry out research on paper chromatography, acid-base titration and colourimetry. Use this information to complete report which addresses the following points:-</p> <ul style="list-style-type: none">• Describe what paper chromatography is and explain how paper chromatography works and include the key terms: mobile phase, stationary phase, solubility, attraction, solvent, solvent front, start line and R_f value, to investigate the chemical composition of food dyes• Provide a complete analysis of your results from your paper chromatography experiment carried on transition day, including the calculation of R_f value for each spot and what this means in terms of samples being pure of a mixture, and if so, which dyes do samples have in common• Compare the techniques of acid-base titration and colorimetry to analyse a sample, which includes a description of how to
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	<p>carry out each technique, when one technique is preferred over another and why, what the results from each show and which is preferable to carry out in a lab in terms of cost, ease and in the analysis and assimilation of results</p> <ul style="list-style-type: none"> • A full evaluation of the effectiveness, limitations, strengths and weaknesses of the use of paper chromatography to analyse the composition of different mixtures
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Checklist of evidence required	<p>Report which:</p> <ul style="list-style-type: none"> • Fully evaluates the effectiveness, limitations, strengths and weaknesses of the use of paper chromatography to analyse the composition of different mixtures • Compares the techniques of acid-base titration and colorimetry to analyse a sample, which includes a description of how to carry out each technique, when one technique is preferred over another, what the results from each show and which is preferable to carry out in a lab in terms of cost, ease and analysis of results • Describes and explains the process of paper chromatography to investigate the chemical composition of food dyes • Analyses your results from your paper chromatography experiment carried on transition day, including the calculation of R_f value for each spot. <p>Sources of information must be appropriately referenced. Correct scientific terminology must be used.</p>
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Criteria covered by this task:

Unit/Criteria reference	To achieve the criteria, you must show that you are able to:
Z. D1	Evaluate the use of paper chromatography to analyse the composition of different mixtures
Z.M1	Compare the techniques of acid-base titration and colorimetry to analyse a sample
Z. P1	Describe and explain the process of paper chromatography to investigate the chemical composition of food dyes
Z. P2	Analyse your results from your paper chromatography experiment carried on transition day

Sources of information to support you with this Assignment	<ul style="list-style-type: none"> • Practical work/documentaries of practical analytical techniques, • Computer-generated simulations. • Guest presentations – Laboratory managers and technicians • Interactive websites/animations/quizzes
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