



Stage 6 Chemistry Depth Study

Wastewater Field report/presentation

Sample Assessment task for Penrith Water Recycling Plant excursion

Depth Study Inquiry Question:

How does the application of chemistry (separation techniques and chemical monitoring) in an industrial setting (Sydney Water) help treat wastewater to protect the environment?

Context:

Students will create a scientific field report or presentation related to application of separation techniques and the need for chemical monitoring during process to protect the environment. Students will do a fieldwork investigation on wastewater treatment processes at Penrith Water Recycling Plant, with secondary research and content from Modules 1 and 8.

Students will:

- participate in fieldwork investigating the processes at a water recycling plant
- gather knowledge and skills to help understanding the implications of chemistry for society and the environment.

The suggested depth study time allocated is 8 hours including:

1. Excursion/ fieldwork at Penrith Water Recycling Plant, where you will:
 - see how we apply separation techniques based on physical and chemical properties to produce recycled water and biosolids
 - understand how wastewater is treated to produce recycled water
 - recognise the importance of monitoring pollutants that can impact our operations and the environment
2. 4 hours in class time for secondary research, data analysis and create report/presentation using our online resources and teacher/student investigations.

Task number: 1	Weighting: 25%	Timing: Term 1, Week 8
Outcomes assessed A student: <ul style="list-style-type: none">• explores the properties and trends in the physical, structural and chemical aspects of matter CH11-8• describes and evaluates chemical systems used to design and analyse chemical processes CH12-15• designs and evaluates investigations in order to obtain primary and secondary data and information CH11/12-2• analyses and evaluates primary and secondary data and information CH11/12-5• communicates scientific understanding using suitable language and terminology for a specific audience or purpose CH11/12-7		
Nature of the task A report/presentation requires students to: <ul style="list-style-type: none">• describe the context of the site (Penrith Water Recycling plant)• explain the relevance of the site to the investigation's question• process and analyse first-hand lab activities, fieldwork and secondary data• communicate the results and conclusion of the fieldwork, lab and research investigations		

Outcomes:

Knowledge and understanding

CH11-8 explores the properties and trends in the physical, structural and chemical aspects of matter

Students:

- explore homogeneous mixtures and heterogeneous mixtures through practical investigations:
– using separation techniques based on physical properties

OR

CH12-15 Describes and evaluates chemical systems used to design and analyse chemical processes

Students:

- analyse the need for monitoring the environment

Planning

CH11/12-2 Designs and evaluates investigations in order to obtain primary and secondary data and information

Students:

- assess risks, consider ethical issues and select appropriate materials and technologies when designing and planning an investigation

Analysis and problem solving

CH11/12-5 Analyses and evaluates primary and secondary data and information

Students:

- assess relevance and reliability of the gathered information
- collate useful and relevant information into water recycling process that relates to separation techniques
- evaluate the effect of chemical monitoring

Communicating

CH11/12-7 Communicates scientific understanding using suitable language and terminology for a specific audience or purpose

Students:

- propose ideas in a coherent and logical way and correctly use scientific terminology and principles
- present information on the science and chemistry of separation techniques and chemical monitoring
- summarise from a range of sources and appropriately acknowledge sources

Conducting Investigations (Optional)

CH11/12-3 Conducts investigation to collect valid and reliable primary and secondary data and information

Students:

- employ and evaluate safe work practices and manage risks
- use appropriate technologies to ensure and evaluate accuracy
- select and extract information from a wide range of reliable secondary sources and acknowledge them using an accepted referencing style

Marking Guidelines:

Students:	Range of Marks
<ul style="list-style-type: none"> • assess risks, consider ethical issues and select appropriate materials and technologies • demonstrate comprehensive knowledge and understanding of using separation techniques based on physical properties that are applied in industries • evaluate the importance monitoring the environment • presents a wastewater treatment process that relates to separation techniques and their uses and applications to protect the environment • assess the relevance and reliability of the gathered information • use scientific terminology and principles effectively • acknowledge sources appropriately and thoroughly 	21–25
<ul style="list-style-type: none"> • assess risks, consider relevant issues, materials and technologies • demonstrate accurate knowledge and understanding of using separation techniques based on physical properties that are applied in industries • discuss the importance monitoring the environment • presents a wastewater treatment process that collates useful and relevant information referring to separation techniques and their uses and applications to protect the environment • describe the relevance and reliability of the gathered information • use scientific terminology and principles • acknowledge sources appropriately 	16–20
<ul style="list-style-type: none"> • assess risks, consider issues, materials and technologies • demonstrate sound knowledge and understanding of using separation techniques based on physical properties that are applied in industries • presents a wastewater treatment process that outlines the applications or uses of acid/bases • describe relevance or reliability of the gathered information • use some scientific terminology • acknowledge sources 	11–15
<ul style="list-style-type: none"> • assess risks, consider issues, materials or technologies • demonstrate basic knowledge and understanding of using separation techniques based on physical properties that are applied in industries • presents a wastewater treatment process that identifies the applications or uses of acid/bases • outlines the relevance or reliability of the gathered information • use limited scientific terminology • acknowledge some sources 	6–10

Students:	Range of Marks
<ul style="list-style-type: none"> • assess risks • gather some relevant information about of using separation techniques based on physical properties that are applied in industries • present an incomplete wastewater treatment process that relates to separation techniques uses and applications • use some scientific terms • attempt to acknowledge some sources 	1–5

Teacher Comments

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Contact us

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