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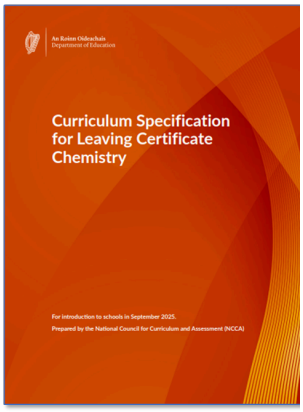
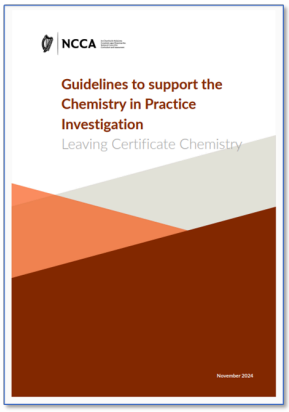
Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí
Supporting the Professional Learning of School Leaders and Teachers

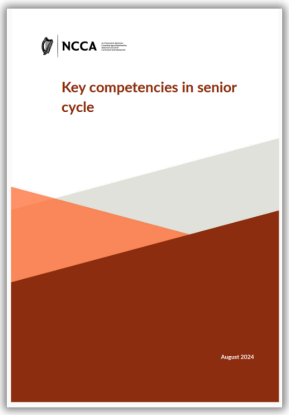
Senior Cycle Chemistry Professional Learning Booklet Day 3 - 2025/26



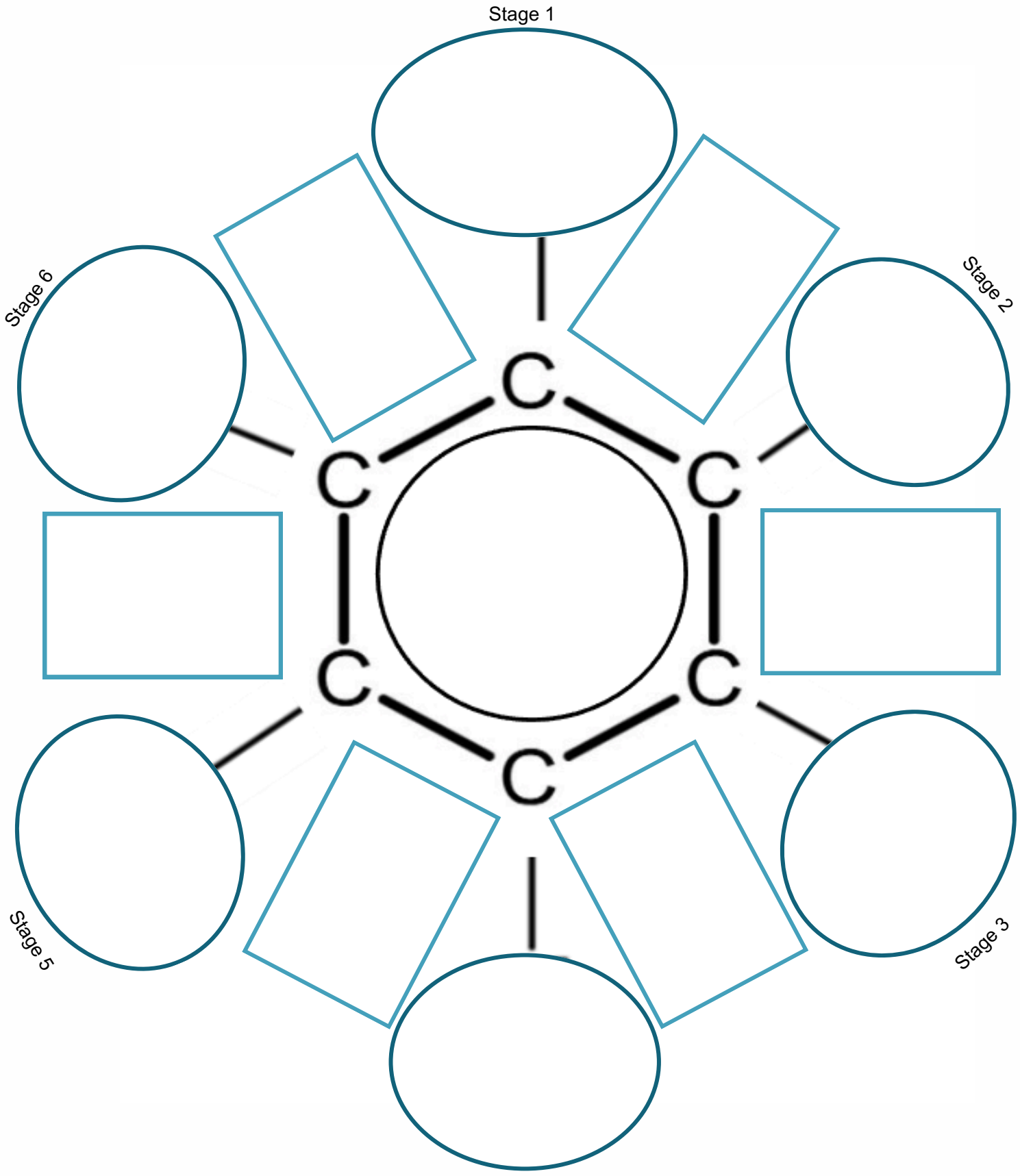


Coimisiún na Scrúduithe Stáit
State Examinations Commission
Corr na Madadh, Baile Átha Luain, Co. na hIarmhí
Cornamaddy, Athlone, Co. Westmeath

Sample Papers Link



Engagement with the Chemistry In Practice Investigation Guidelines



20 Ca 40.08
33 As 74.92
44 Ru 101.1
45 Rh 102.9
105 Db 262.1
14 Si 28.09
16 S 32.07

Credibility: Who is the author? What evidence is offered of their knowledge?

Accuracy: Can facts & statistics be verified? Does there appear to be errors on the source?

Reliability: Does the source present bias?

Relevance: Does the information directly support or help to answer my question?

Date: When was the information created? Does my question need current information?

Source: Is the information based on primary or secondary sources? Did the author document their sources?

Scope/Purpose: Does this source address my question comprehensively?

21 Sc 44.96
6 C 12.01
13 Al 26.98
12 Mg 24.31
15 P 30.97
99 Es 252.1
88 Ra 226.0

Substitute (Swap): Could I swap for a different chemical, object, method, variable, material or piece of apparatus?

Combine (Bring together): Could I combine methods or pieces of equipment to test my hypothesis?

Adapt (Change): Could I adapt a piece of apparatus/methods to serve my needs?

Modify (Magnify/Minify): Could I modify the experiment set-up to make it safer/larger/smaller?

Purpose (Put it to another use): Could the products or byproducts of my experiment be used for something else?

Eliminate (Remove): Could I remove a variable/eliminate a piece of equipment/make simpler?

Reverse (Rearrange): Would rearranging the order of the steps in my method produce a different outcome/work better/be more efficient?

Station 1 - Rates of Reaction

	SCAMPER	Planning Considerations 
Investigation A		
Investigation B		
Investigation C		

Station 2 - Saponification

CARDDSS

If you are using R (Relevance) to engage with the article, please consider one of the following suggested questions to support your engagement. You may also create your own question if you wish

1. Which oil extraction method (cold vs. hot pressing) is more sustainable from an energy use and waste production perspective?
2. How does the percentage oil content of different plant sources affect the amount of soap produced during saponification?

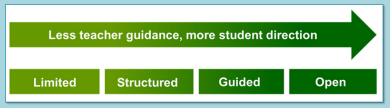
Station 3 - Heat of Combustion

	Strengths	Planning Considerations 
Investigation A		
Investigation B		
Investigation C		

Station 4 - Esterification

	Limitations (and Possible Solutions)	Planning Considerations 
Investigation A		
Investigation B		
Investigation C		

Station 5 - Electrolysis

	**How could you move this investigation along the continuum of inquiry to better suit your students' needs?**	**Planning Considerations** 
Investigation A		
Investigation B		
Investigation C		

The Conservation of Mass

From the investigations you have engaged with today, which learning outcomes from the contextual and unifying strands could your students engage with while investigating the conservation of mass?

Station 1: LO 3.2.3, p. 25
Station 2: LO 4.2.14, p. 33
Station 3: LO 3.1.8, p. 25
Station 4: LO 4.2.8, p. 32
Station 5: LO 3.5.6, p. 28

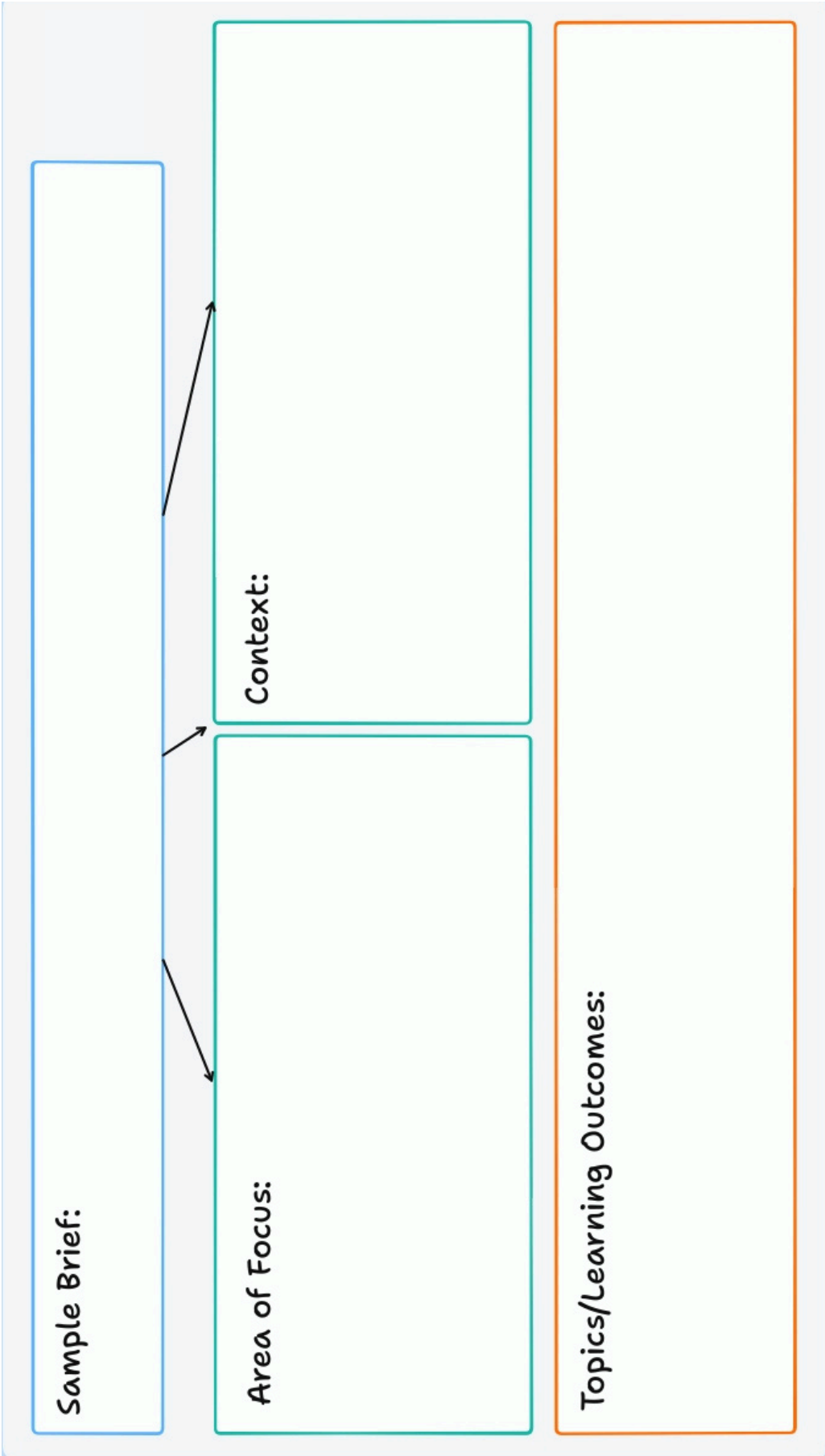
Planning to Prepare Students' for the Chemistry in Practice Investigation

Points to consider:

- The identification of opportunities to:
  - Incrementally develop students' skills and practices in line with the 6 stages of the AAC
  - Investigate supported by primary and secondary data
- Students' prior knowledge, UDL considerations and the needs of the student cohort
- Reflect on opportunities to extend or modify investigations using the suggested SCAMPER & CARRDSS strategies
- How can developing an adaptable sequence of themes, focusing on the Contextual Strands, the Unifying Strand, and your school context, support the incremental development of your students' scientific practices?

Plan how your students will engage with the six stages of the investigative process over the two years of Senior Cycle

Planning to Prepare Students' for the Chemistry in Practice Investigation



Possible Reflective Questions to Consider When Planning Investigations

- Is this a research-based or experimental investigation, and how open or closed is it?
- What learning outcome(s) are engaged with during this investigation?
- What specific skills will students develop or practice during this investigation, including both skills they have used before and skills that are new to them?
- How does this investigation fit within the sequence of skill development for students, particularly for their AACs?
- Is this investigation a variation or extension of a Junior Cycle Science investigation, or is it novel?
- What prior knowledge or concepts do students need before starting the investigation?
- What background theory and sequencing of activities (e.g., assignments, homework) will support this investigation?
- What equipment, chemicals, and stock solutions are required, and at what concentrations and volumes?
- Is this a full-scale, small-scale, or micro-scale investigation, and what lead time is needed to prepare it?
- Which lesson(s) will this take place in, and is it during a single or double period or across multiple lessons?
- Are there specific techniques students must practice beforehand for the investigation to be successful?
- What safety information or instructions should be included at the start of the investigation to help ensure clarity and safety?
- What type of data will students collect, such as observations or measurements, and what methods will they use to collect it?
- How will data be recorded, and will students use tables, calculate means, or use each other's data as secondary data?
- How can accuracy, precision, and validity be discussed, and should students compare results to theoretical values or calculate errors?

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SCAMPER

Adapt

- Could I adapt a piece of apparatus to serve my need?
- Could I adapt a method to work for my experiment?
- Could a solution to one issue be adapted to help solve a different issue?

Modify

- Could I modify the time taken for my experiment? Could I modify an experimental set up to make it safer?
- What could I make bigger or smaller to improve the efficiency of my design?

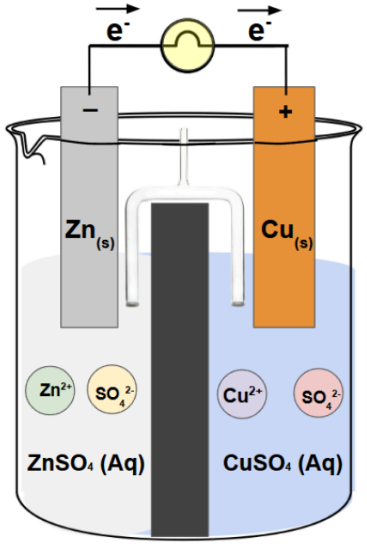
Purpose

- Could the products or by products of my experiment be put to a use in the real world?
- Could my apparatus, method or device be used for something else? Could I use my apparatus in other investigations?

Combine

(Bring together)

- Could I combine methods or pieces of apparatus to test my hypothesis?
- If I repeat the test many times and combined the results to get an average, would it improve my investigation?



Eliminate

- Could I remove a variable affecting my results?
- Could I eliminate a piece of apparatus?
- What can be removed or simplified?

Substitute

- Could I swap for a different chemical, object, method, variable, material or piece of apparatus
- Could I replace any parts or features in the original to improve or change the design to make it my own?

Rearrange

- Would rearranging the order of steps in my method produce a different outcome?
- What if I reversed the way my device works
- What other arrangement might work better or more efficiently?

Substitute (Swap)	Combine (Bring together)	Adapt (Change)	Modify (Magnify/Minify)	Purpose (Put to another use)	Eliminate (Remove)	Rearrange (Reverse)
What happens to the voltage if I replace zinc or copper with a different metal (e.g., iron or aluminium)?	What effect does connecting multiple galvanic cells in series or parallel have on the voltage?	Adjust the experiment to create a miniature battery to power an LED or small device	How does changing the size and shape of the electrodes influence the voltage output?	How might I apply this galvanic cell set-up to the topics of health, technology and sustainability?	What happens to the voltage when the salt bridge is removed from the setup?	How does reversing the positions of the electrodes affect the direction of electron flow?

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Please note: The questions detailed above are examples and are not intended to be exhaustive

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