Leaving Certificate
Agricultural Science

Coursework Evening 2023
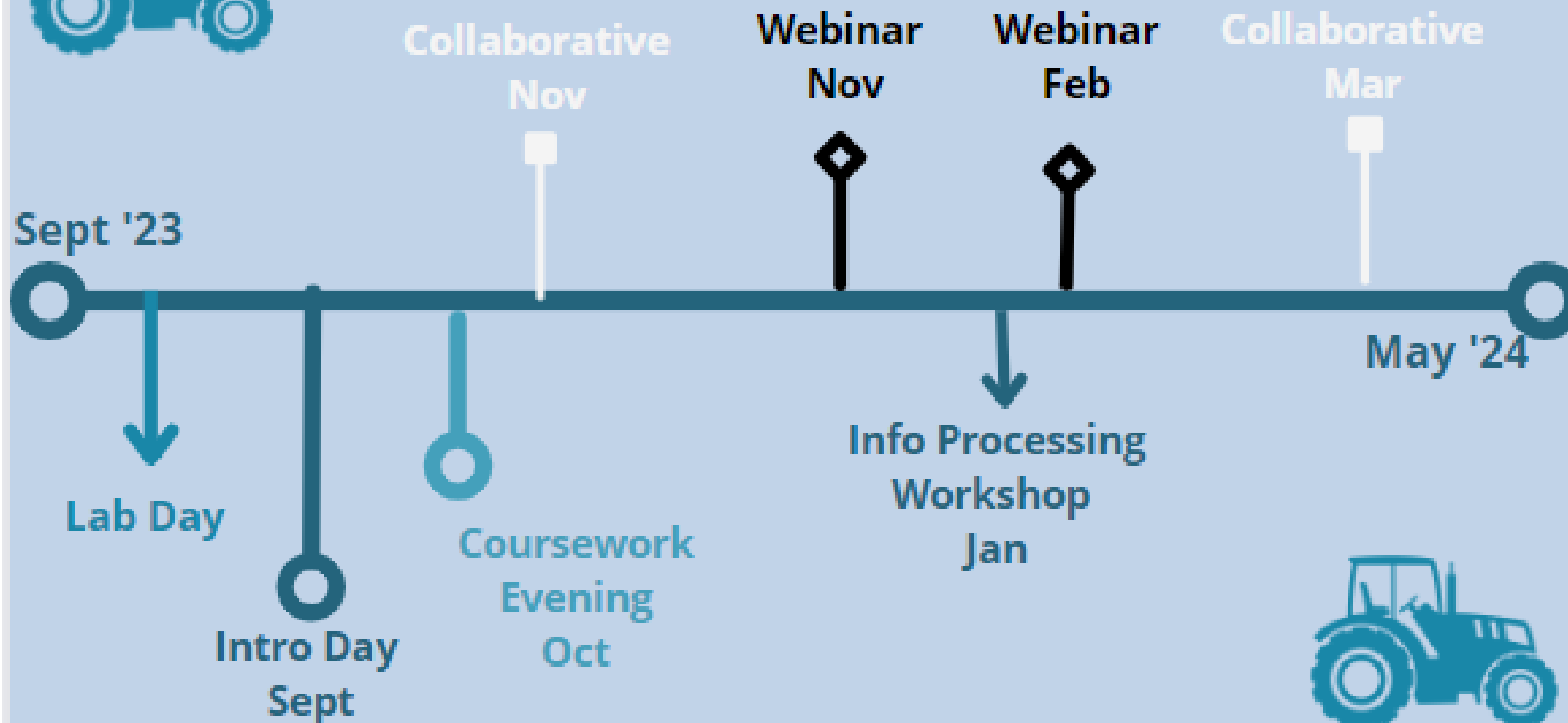
Overview of the Evening

Time	Outline
19:00 - 19:50	Session 1: Reflecting on Our Practice and Planning for the Future
19:55 - 20:05	Tea/Coffee
20:05- 20:55	Session 2: Developing Research Questions and Practical Considerations supporting the IIS
20:55 - 21:00	Evaluation

Collaborative Workspace

Please open the Padlet and upload contributions when prompted to do so by your Facilitator by using the QR code or the link below:

https://padlet.com/agsciencewebinar1/remake-of-coursework-evening-54kra08gpw6uto25

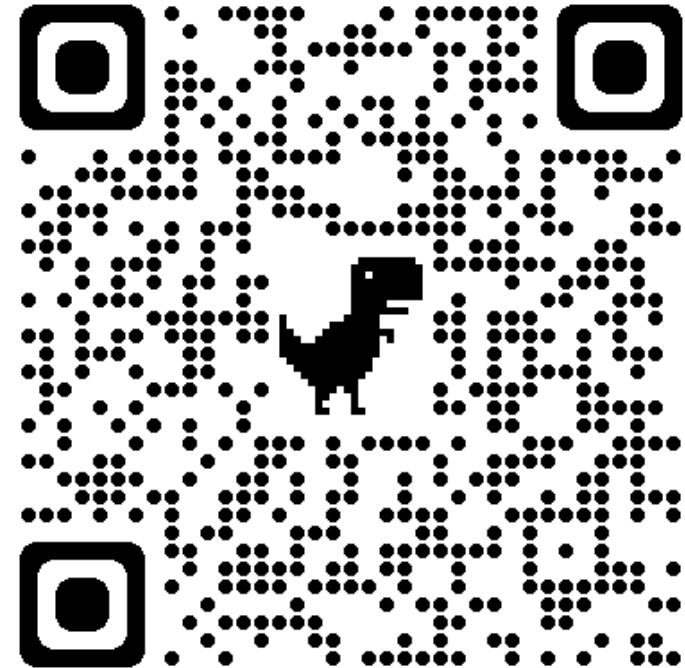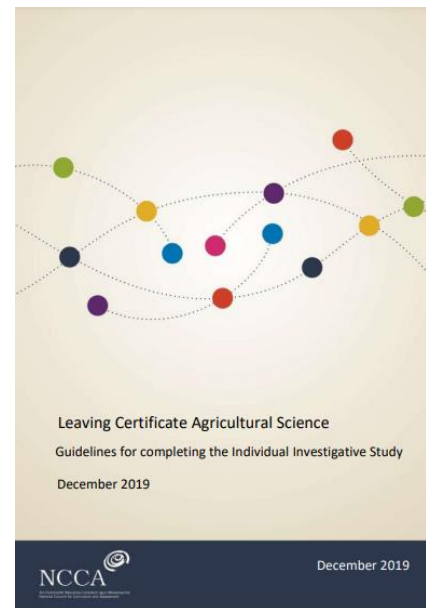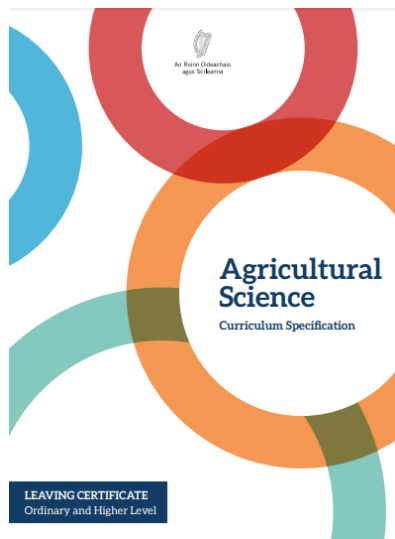Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Looking at the Evidence

Agricultural Science
Curriculum Specification

LEAVING CERTIFICATE
Ordinary and Higher Level

2025L024C2EL

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2025

Agricultural Science

Individual Investigative Study

Coursework Brief

Common Level

100 marks

Leaving Certificate Agricultural Science

Guidelines for completing the Individual Investigative Study

December 2019

NCCA   December 2019

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Coursework

Information note for four Leaving Certificate subjects with new subject specifications

- Agricultural Science – Individual Investigative Study
- Computer Science – Coursework Project
- Economics – Student Research Project
- Physical Education – Physical Activity Project

"The skills developed in the specified practical activities will be used by the student to successfully complete the individual investigative study" (Agricultural Science Specification P. 27)

Looking at the Evidence

Oide

Strand 1: Scientific practices

STUDENTS LEARN ABOUT:	STUDENTS SHOULD BE ABLE TO:
1.1 Hypothesising	▸ use observations as the basis for formulating a hypothesis ▸ apply their knowledge and understanding of Agricultural Science to develop arguments or draw conclusions related to both familiar and unfamiliar situations ▸ compile and interpret data or other information gathered from print, laboratory, and electronic sources (including websites), to research a topic or solve a problem ▸ make a prediction based on the hypothesis
1.2 Experimenting	▸ design, manage and conduct practical investigations ▸ identify variables and select appropriate controls ▸ collect, organise, interpret, present and analyse primary and secondary data with and without the use of technology ▸ describe relationships (qualitatively and/or quantitatively) between sets of data, recognising the difference between causation and correlation ▸ distinguish between statistical and systematic uncertainty and identify appropriate methods to reduce these ▸ recognise uncertainty as a limitation of the process of measurement ▸ appreciate the difference between accuracy and precision ▸ conduct an open-ended investigation
1.3 Evaluating evidence	▸ critically examine the scientific process that was used to present a scientific claim ▸ appreciate the limitations of scientific evidence ▸ make judgements and draw informed conclusions arising from the result of the investigation—their own and those of others—and consider the reliability and validity of data ▸ make predictions on the behaviours of systems based upon interpretation of numeric, graphic and symbolic representations ▸ evaluate ethical issues related to agricultural practices
1.4 Communicating	▸ communicate the procedures and results of investigations by displaying evidence and information in various forms, including flow charts, tables, graphs, and laboratory reports ▸ discuss, debate, reflect on and critically evaluate the outcomes of investigations, their own and those of others ▸ read and evaluate scientific information related to agriculture, drawing on a variety of sources: media, websites, agri-food events and other agricultural resources—including people involved in the agri-food industry
1.5 Working safely	▸ identify health and safety hazards associated with agricultural practices and discuss controls and precautions necessary to prevent accidents, injury and ill health ▸ discuss the health and safety considerations of using agricultural machinery and equipment ▸ recognise the need for safe work practices in all agricultural activities

Report structure and mark allocations

Section	Indicative content to be included	Marks
Introduction and background research Suggested range between 300 and 500 words	▪ Give a title to your Individual Investigative Study. ▪ Identify the agricultural enterprise chosen as the context for the study and state the topic selected for investigation. ▪ State the research question, and make clear how it relates to the theme of the brief and the chosen enterprise. ▪ Outline what the initial research you carried out tells you about the topic and the research question. Include references. (Use short in-line citations here, with full references at the end of the report.)	20
The investigative process Suggested range between 500 and 800 words	▪ Describe the specific experiments and other relevant investigative activities undertaken, stating clearly the purpose of each and describing how it was carried out. ▪ Make clear what specific hypotheses were developed and tested. ▪ Describe in detail how you gathered the data.	25
Results, analysis, and conclusions Suggested range between 600 and 1000 words	▪ Present the data and results from your investigation. Use tables, graphs, and photographs as appropriate. ▪ Analyse and interpret the data, results, and other information. ▪ Make judgements and draw conclusions from your analysis. ▪ Take due account of any relevant limitations of your study. ▪ Link the conclusions clearly to the research question.	35

Reflection on the study
Suggested range between 150 and 200 words
	▪ Reflect on the insights gained from engagement with the study and comment on:
	  ○ The degree to which the research question was answered
	  ○ Possible changes or alternative approaches that might have made the investigation better
	  ○ Future directions and possible areas of further investigation
	  ○ Significance of the outcomes of the study for the agri-food sector and/or the study of agricultural science.
		10

References	▪ Full references for all sources used during the study and/or referred to in the report. This section will not attract a separate mark. Any deficiencies in referencing will be taken account of when marking the relevant section of the report.	-
Communication and innovation	This is not a distinct section of the report. Marks will be awarded for evidence of taking an individual approach, for coherence and for innovative thinking.	10

"In addition, some of the skills developed during the individual investigative study will also be assessed in the written examination." (Specification, P. 27)

Looking at the Evidence
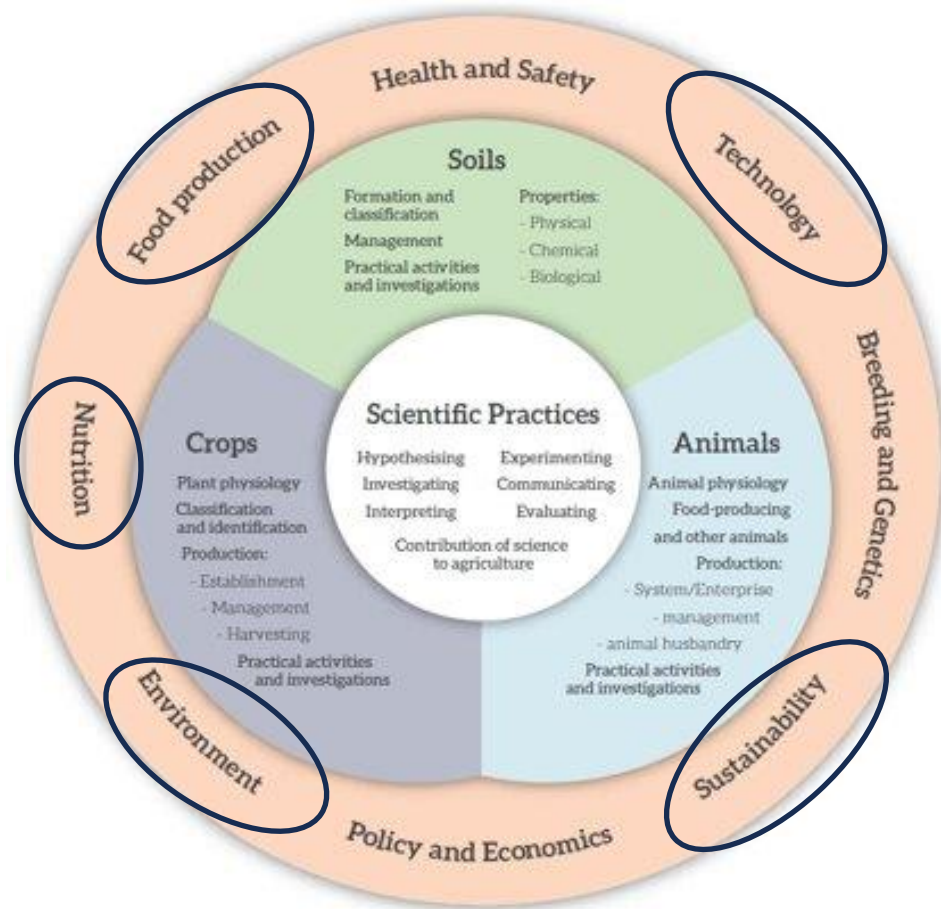
The brief will relate to an area of agricultural significance and be relevant to the cross-cutting themes of the course.
(Guidelines for completing IIS, NCCA, 2019)

Think Pair Share

Consider the following question:

In preparing your students to engage with the IIS brief, in previous years, what has worked well for you?

1. Take time to *Think* about it individually
2. *Pair* up with the person next to you and share your idea
3. Then *Share* with another two people.

Post your experience on the Padlet wall.

IIS Brief for 2025 Cohort

The theme for the 2025 brief is, "Investigate how _change(s) in agricultural practice and / or advances in technology_ can contribute to a positive future for Irish agriculture".

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2025

Agricultural Science
Individual Investigative Study
Coursework Brief
Common Level

100 marks

Thematic brief 2025

The theme for the 2025 brief is, "**Investigate how change(s) in agricultural practice and / or advances in technology can contribute to a positive future for Irish agriculture**".

Use the theme, "**Investigate how change(s) in agricultural practice and / or advances in technology can contribute to a positive future for Irish agriculture**" as a "lens" to look through while undertaking the learning contained in the specification's strands and crosscutting themes.

In your Individual Investigative Study, you should do the following;
- Choose a specific agricultural enterprise[1] and a topic relevant to that enterprise and to the theme.
- Develop a research question that is related to the theme and which you would like to investigate in the context of the chosen enterprise.
- Carry out initial research on the topic as it relates to the theme.
- In the context of your chosen enterprise, investigate the topic by carrying out one or more experiments, supplemented, if appropriate, by other investigative activities. Carry out specific scientific investigation(s) of the topic. This will involve developing and testing specific hypothesis and drawing conclusions based on evidence gathered.
- At least one of the experiments you carry out must involve gathering and processing data.
- Document and present your work in the digital coursework booklet provided by the State Examinations Commission for marking.

Submit the final report to your teacher on or before **2 May 2025**. You are not allowed to make any changes to it after that date.

Some references to get you started in your research – this list is not exhaustive.
- Teagasc - SmartAgriFood - Teagasc | Agriculture and Food Development Authority
- Technology Foresight Report 5 (2015), published by Teagasc - Microsoft Word - Technologies_Scoping_Doc_v.5_07052015.docx (teagasc.ie)
- Technology Foresight Report 2035 (2016), published by Teagasc - Teagasc-Technology-Foresight-Report-2035.pdf
- Farming for a Better Future - Technologies for Today and Tomorrow (30 August, 2022), published by Teagasc, Teagasc-Johnstown-Castle-Open-Day-Booklet-2022.pdf
- KPMG Agri-food 2030:edition 1 (2022); Agri Food 2030 (kpmg.com)
- Horizon Europe strategic plan 2021-2024 (2021), European Commission-Directorate General for Research and Innovation – Horizon Europe - Publications Office of the EU (europa.eu)
- Improving Farm Sustainability-practical tools for farmers Teagasc (2019),- Untitled-1.indd (teagasc.ie)
- David Mc Williams, 'The future of Irish agriculture is tech', Agriland (2021), David McWilliams: The future of Irish agriculture is tech - Agriland.ie
- Smart Grass: improving the sustainability of livestock farming, (March 2022),UCD Research-Helen Sheridan et al., SmartGrass: improving the sustainability of livestock farming | UCD Research
- The role of science, technology and innovation in ensuring food security by 2030, (2017), UNCTAD – The role of science, technology and innovation in ensuring food security by 2030 (unctad.org)
- How technology can help address challenges in agriculture, (2022), World Economic Forum. Agriculture needs technology for resilient food production | World Economic Forum (weforum.org)
- Agriculture 4.0: The future of farming technology, (2022), Matthew De Clercq et. al Agriculture 4.0 – The Future of Farming Technology (oliverwyman.com)
- How technology changed farming? (2023), Bayer - How Has Technology Changed Farming? | Bayer Global

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Supporting the Professional Learning of School Leaders and Teachers

IIS Brief for 2024 Cohort

The theme for the 2024 brief is, "*The role of food production in maintaining natural resources in Irish Agriculture*"

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2024

Agricultural Science
Individual Investigative Study
Coursework Brief
Common Level

100 marks

Thematic brief 2024

The theme for the 2024 brief is, "**The role of food production in maintaining natural resources in Irish Agriculture**".

Use the theme, "**The role of food production in maintaining natural resources in Irish Agriculture**", as a "lens" to look through while undertaking the learning contained in the specification's strands and crosscutting themes.

In your Individual Investigative Study, you should do the following;

- Choose a specific agricultural enterprise[1] and a topic relevant to that enterprise and to the theme.
- Develop a research question that is related to the theme and which you would like to investigate in the context of the chosen enterprise.
- Carry out initial research on the topic as it relates to The theme.
- In the context of your chosen enterprise, investigate the topic by carrying out one or more experiments, supplemented, if appropriate, by other investigative activities. Carry out specific scientific investigation(s) of the topic. This will involve developing and testing specific hypothesis and drawing conclusions based on evidence gathered.
- At least one of the experiments you carry out must involve gathering and processing data.
- Document and present your work in the digital coursework booklet provided by the State Examinations Commission for marking.

Submit the final report to your teacher on or before **12 April 2024**. You are not allowed to make any changes to it after that date.

Some references to get you started in your research – this list is not exhaustive.

- Food Wise 2025 – a 10 year vision for the Irish agri-food industry (2015), published by Department of Agriculture, Food and the Marine. file:///C:/Users/secit/Downloads/109085_e436312e-df39-45ed-8ad2-a05aad476c4f.pdf
- Teagasc Food Harvest 2025 Submission (April 2015), published by Teagasc. https://www.teagasc.ie/media/website/publications/2015/Teagasc_Food_Harvest_2025_Submission.pdf
- Ballyhaise '22 Open Day (July 2022), published by Teagasc. https://www.teagasc.ie/media/website/publications/2022/Ballyhaise-Open-Day-book.pdf
- Establishing Multi-Species Swards on your Farm (14 June 2022), Aoife Forde. https://www.teagasc.ie/publications/2022/establishing-multi-species-swards-on-your-farm.php
- Soil Health is our Wealth, (15 July 2020), published by Teagasc. https://www.teagasc.ie/publications/2020/soil-health-is-our-wealth-.php
- Teagasc Technology Foresight 2035 (2016), published by Teagasc. https://www.teagasc.ie/media/website/publications/2016/Teagasc-Technology-Foresight-Report-2035.pdf
- Ireland's Environment – An Integrated Assessment 2020, chapter 13 - Environment and Agriculture, published by the EPA. https://www.epa.ie/publications/monitoring--assessment/assessment/state-of-the-environment/EPA-Ireland's-Environment-2020-Chapter13.pdf
- Agriculture and rural development, supporting EU farmers, food security, the environment and rural areas (2022), The European Commission. https://agriculture.ec.europa.eu/sustainability/environmental-sustainability/natural-resources_en
- Farmers Feed the World While Protecting Natural Resources, (June 30, 2021) Kevin Krentz, published by the American Farm Bureau Federation. https://www.fb.org/viewpoints/farmers-feed-the-world-while-protecting-natural-resources
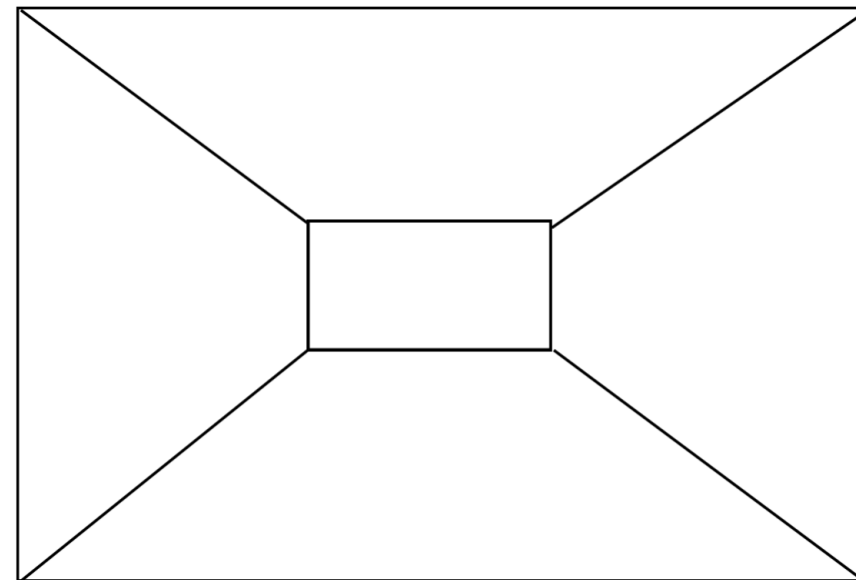
Placemat Activity

Given the title of the brief what initial ideas do you have?

- Write down your initial ideas that you have on your section of the placemat.
- Share your ideas with the rest of your group.
- Collectively choose four ideas your group would like to develop further in Session 2. Write these in the centre of the placemat.
- Post a photo of this to the Padlet

Collaborative Workspace

Please open the Padlet and upload contributions when prompted to do so by your Facilitator by using the QR code or the link below:
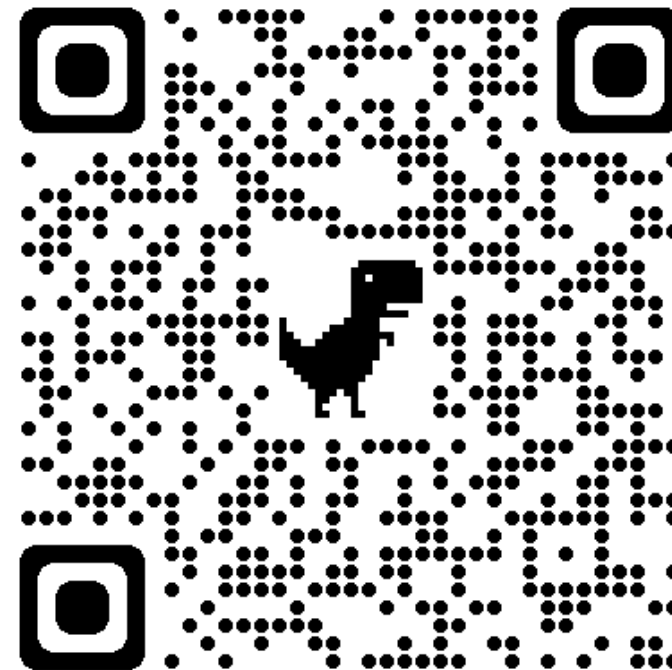
Coffee Break

Session 2

Developing Research Questions
and Practical Considerations
Supporting the IIS

SMART Planning

Specific - the investigation should have clear **testable question/hypothesis** that it is trying to answer. Is it related to the brief? Does it focus on a single topic or issue?

Measurable- the variables should be **clearly defined and measurable** to yield data that can be analysed. Can we **gather primary data safely?**

Authentic- Is it the student's **own** work? Is it an original or **innovative** idea?

Realistic- There is consideration in the design to account for the equipment and resources available to you and that the investigation is **safe.**

Time- Can the investigation be carried out in a realistic **timeframe**?

Developing a Research Question

Using your initial idea from Session 1 can you develop it further using the template from pg 19, of NCCA Guidelines:

- Appendix 2: Suggested prompts for evaluating the suitability of a topic in response to the brief

Developing a Research Question… Further

After evaluating the suitability of your topic in response to brief complete Appendix 3 pg. 20, of NCCA Guidelines:

- Appendix 3: Suggested experimental plan

Supporting Innovation

- Build on student interest

- Build on CBAs

- Build on SPAs – extend, adapt or modify

- Brainstorm e.g. SCAMPER

- Cross curricular links e.g. Technology, Coding

- Encourage innovation with approach to SPAs

Tacú leis an bhFoghlaim
Ghairmiúil i measc Ceannairí
Scoile agus Múinteoirí

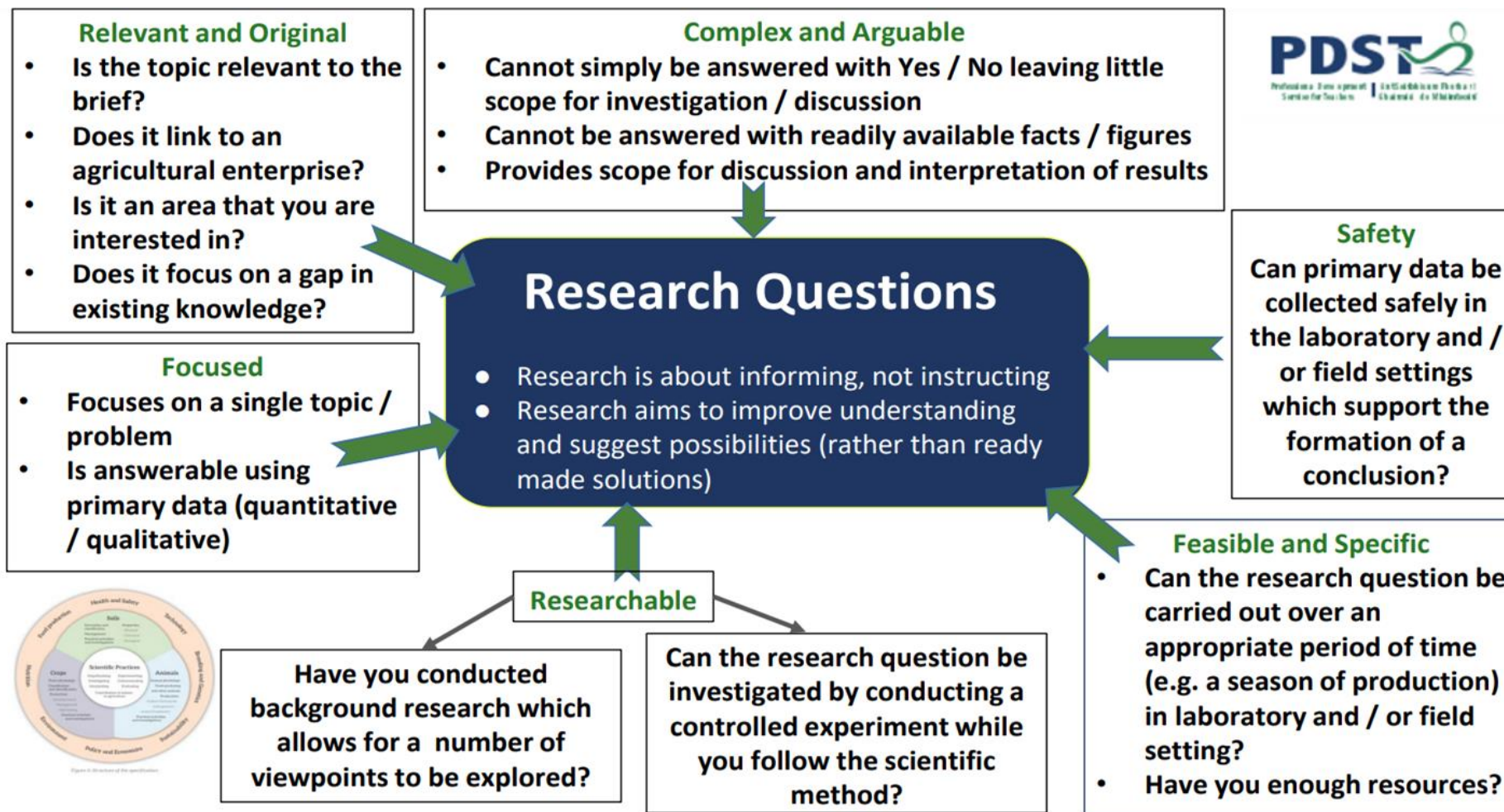Supporting the Professional
Learning of School Leaders
and Teachers

Building on SPAs

The Individual Investigative Study allows students to design their own investigations, stemming from their areas of interest and/or experience in the field. ***They can also choose to adapt, modify and extend specified practical activities*** from the course. (Guidelines for the IIS, P.12)

Developing a Research Question

Relevant and Original
- Is the topic relevant to the brief?
- Does it link to an agricultural enterprise?
- Is it an area that you are interested in?
- Does it focus on a gap in existing knowledge?

Complex and Arguable
- Cannot simply be answered with Yes / No leaving little scope for investigation / discussion
- Cannot be answered with readily available facts / figures
- Provides scope for discussion and interpretation of results

Research Questions
- Research is about informing, not instructing
- Research aims to improve understanding and suggest possibilities (rather than ready made solutions)

Safety
Can primary data be collected safely in the laboratory and / or field settings which support the formation of a conclusion?

Focused
- Focuses on a single topic / problem
- Is answerable using primary data (quantitative / qualitative)

Researchable

Have you conducted background research which allows for a number of viewpoints to be explored?

Can the research question be investigated by conducting a controlled experiment while you follow the scientific method?

Feasible and Specific
- Can the research question be carried out over an appropriate period of time (e.g. a season of production) in laboratory and / or field setting?
- Have you enough resources?

IIS Supportive Information

A document containing helpful information for teachers and students about completing the written report of the Individual Investigative Study.

It contains tips for completing each section as well as links to:

- Referencing tools

- Literacy supports

- SEC Information Note & Marking Criteria

- Supportive informative videos

Evaluation

https://forms.gle/DRcYyMeyk7WF2y7c8