



Oide

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Scoile agus Múinteoirí

Supporting the Professional
Learning of School Leaders
and Teachers

Leaving Certificate Physics Focus on Skills Development

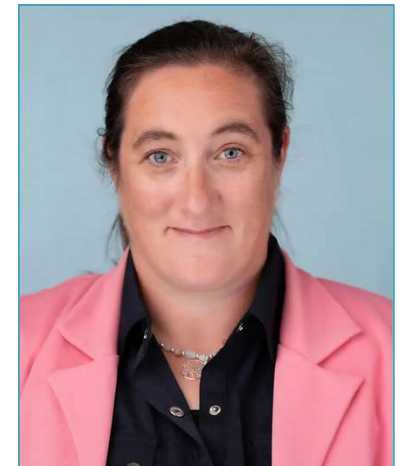
Professional Learning Experience – PLE 4



An Fhoireann Eolaíochta Oide Science Team



Oide



Helen Van Eesbeck
Ceannaire Sinsearach

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Supporting the Professional
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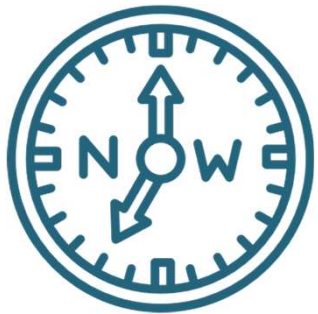


Sceideal - Schedule

Seisiún 1 9:15 – 11:15	Reflection and thematic planning
11:15 - 11:30	Tae/Caife
Seisiún 2 11:30 – 13:15	Investigating Physics: From Concrete Experience to Scientific Understanding
13:15 - 14:15	Lón
Seisiún 3 14:15 – 15:45	Supporting Productive Struggle

Shared Expectations

Be present



Engage



Collaborate respectfully



Minimise distractions



Take care



Give yourself permission to step away from school business for the day.

Your experiences and insights enrich discussions.

Listen, share and support each other as professionals.

Where possible, keep laptops and phones for workshop use only.

Use breaks to check in with school matters if needed.

Cineálacha Tacaíochta a Sholáthraíonn Oide

Range of Support provided by Oide



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Collaboratives

Webinars

Oide.ie /
Oide technology in
education.ie

Half Day
Professional
Learning
Experiences

Full Day
Professional
Learning
Experiences



Scoilnet.ie

School Support
Visits

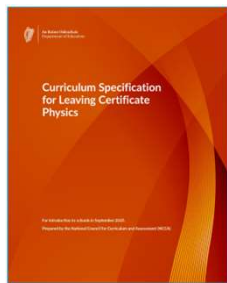


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Support to Date

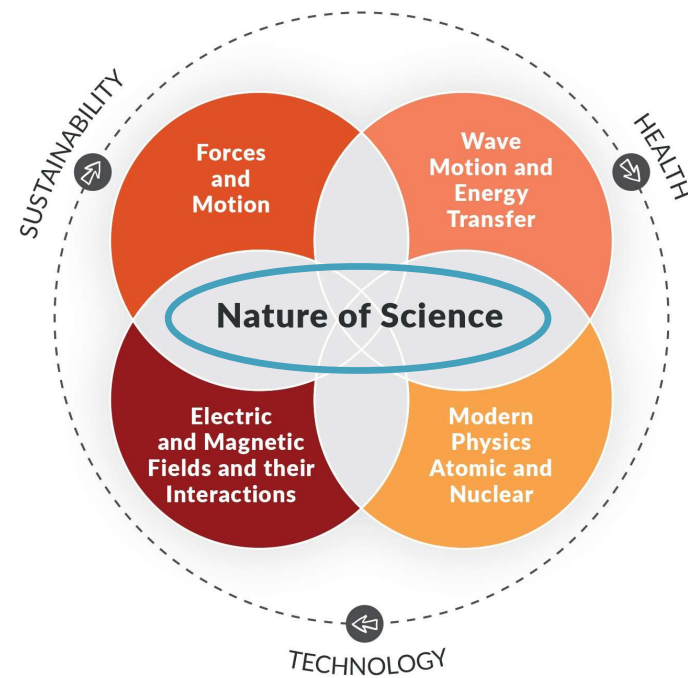
Autumn 2024
PLE 1

The Unifying
Strand



The Unifying
Strand

PHYSICS



Resources

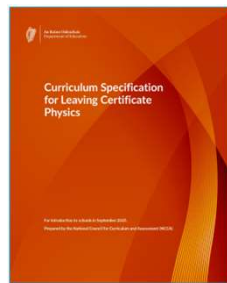


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Support to Date

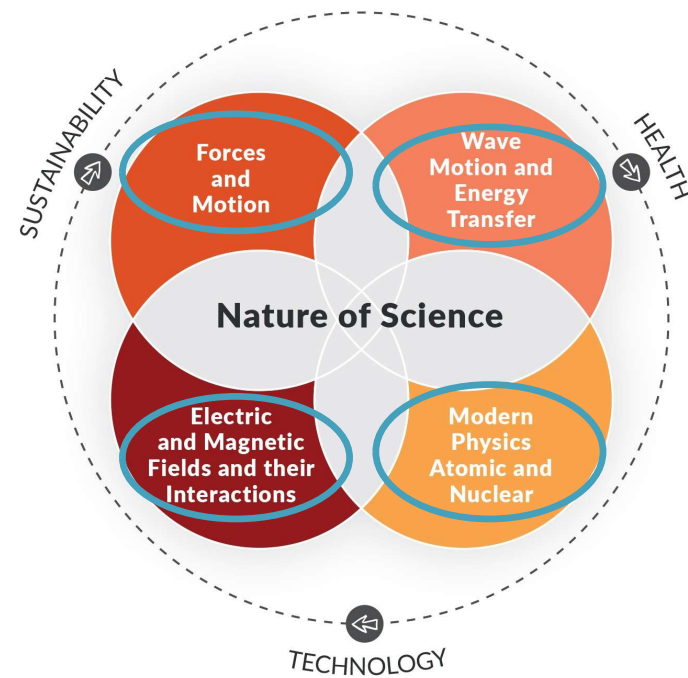
Spring 2025
PLE 2

Introduction to
Specification



Contextual
Strands

PHYSICS



Resources

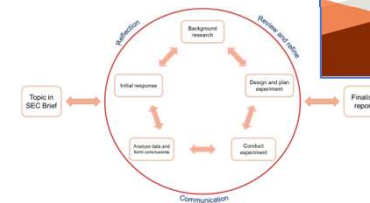
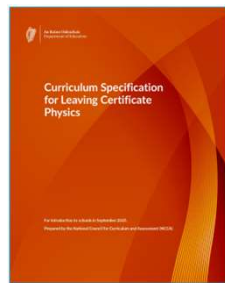


Oide

Support to Date

Autumn 2025
PLE 3

Laboratory
Practical work



Investigation/AAC
and Practical work



Resources



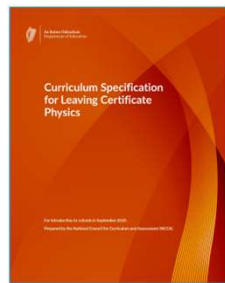
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Support to Date

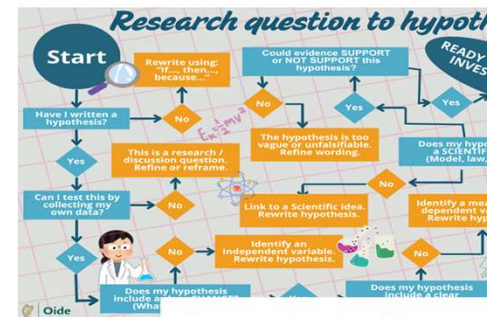
Spring 2026

PLE 4

Research,
AAC



Background
research



Search Vs Research

Searching vs Researching



Resources

Research
AAC



Support to Date



Autumn 2024
PLE 1

The Unifying
Strand

Spring 2025
PLE 2

Introduction to
Specification

Autumn 2025
PLE 3

Laboratory
Practical work

Spring 2026
PLE 4

Research,
AAC

Autumn 2026
PLE 5

Skills
Development

Collaboratives and Webinars

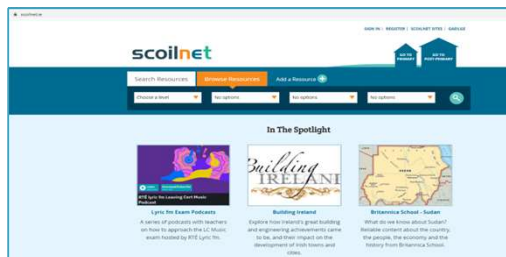
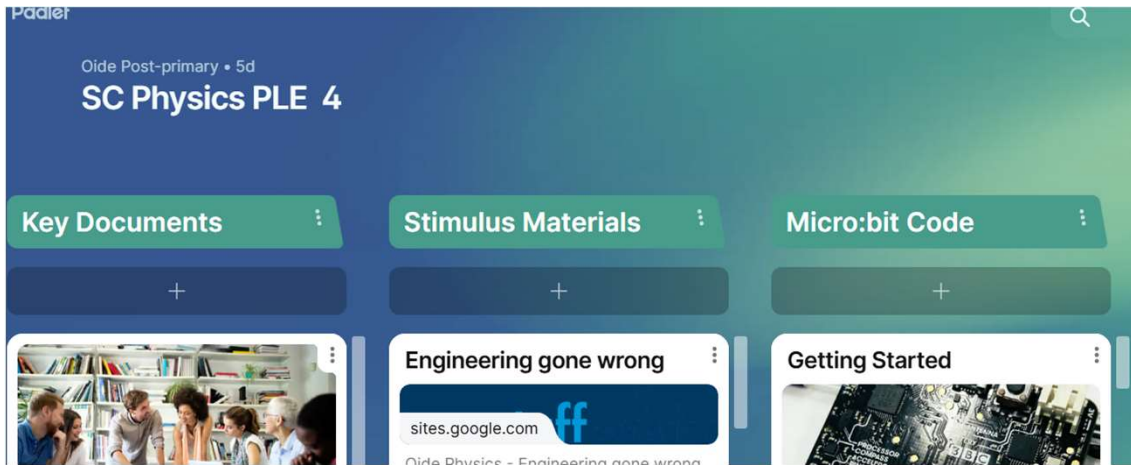
Slide 10

HE1 PLE 5- is the focus of this day on assessment or skills development?
Helen Van Eesbeck, 2026-05-26T09:33:49.881

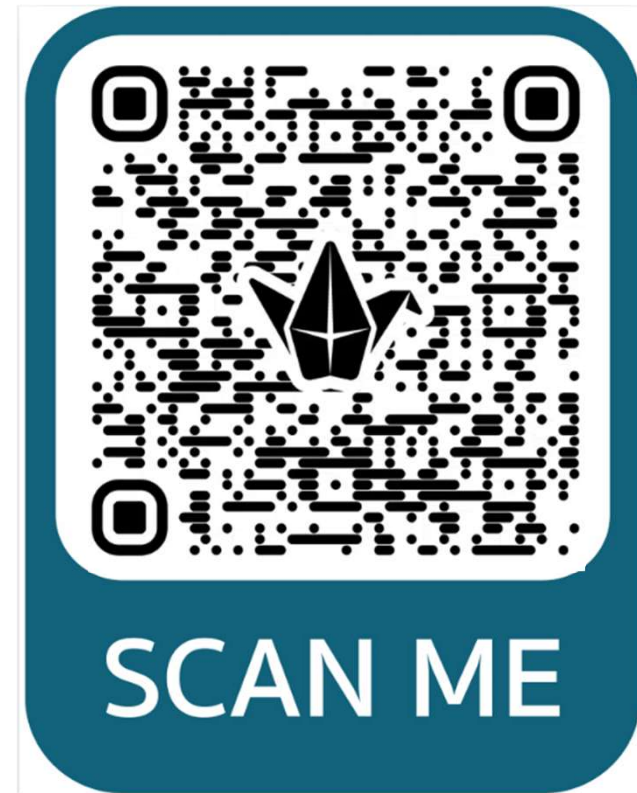
Achmhainní/Resources



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www.scoilnet.ie

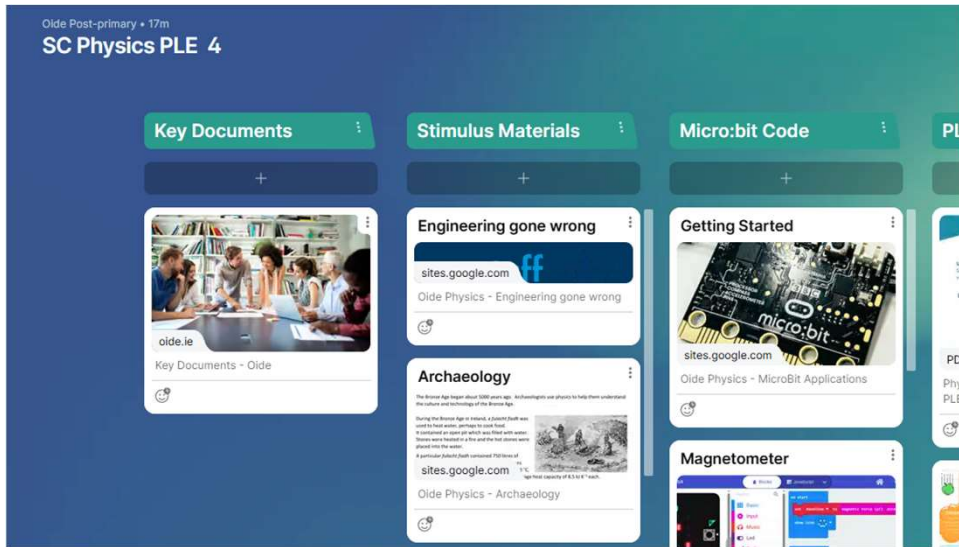


<https://tinyurl.com/yp5m76y9>

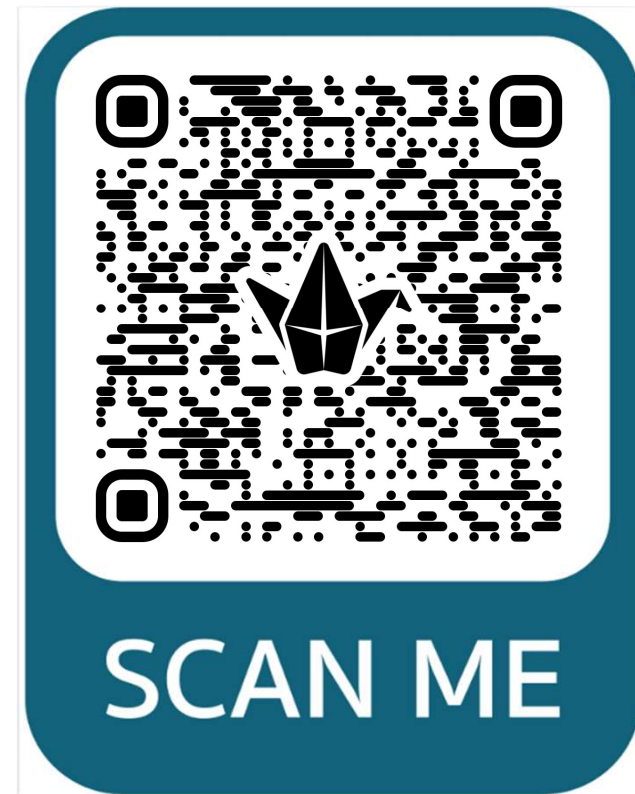
Achmhainní/Resources



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tinyurl.com/OidePhysicsPLE4



Slide 12

HE1

Love this slide - just change the padlet to Physics day 5

Helen Van Eesbeck, 2026-05-26T09:34:45.260



Key Supporting Documents



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Learning of School Leaders
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Slide 13

HE1

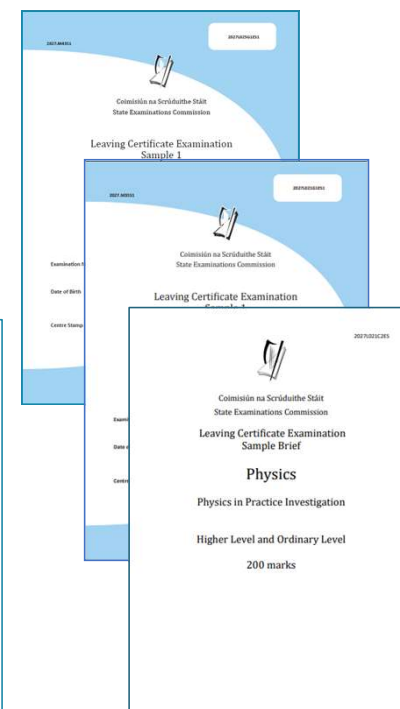
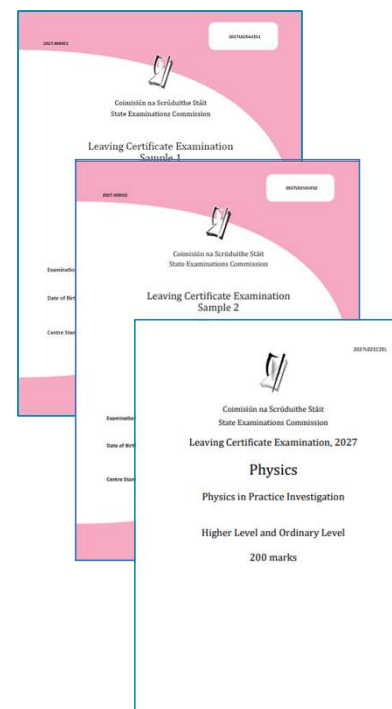
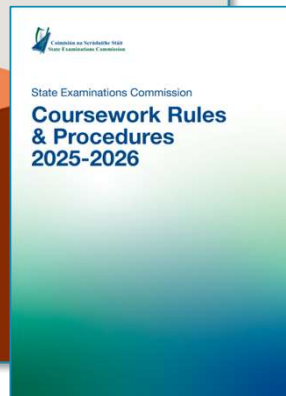
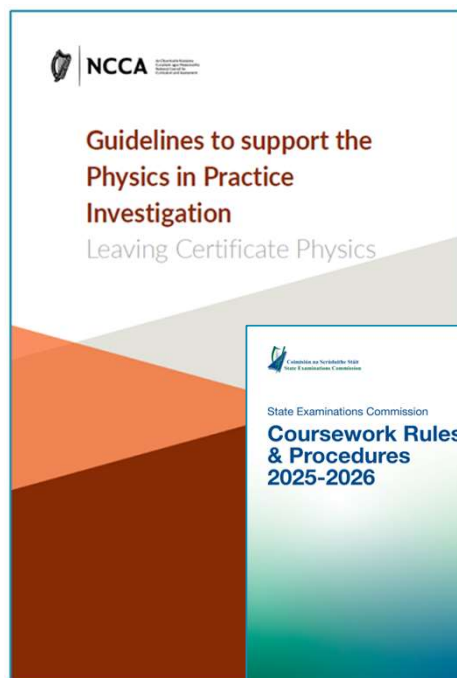
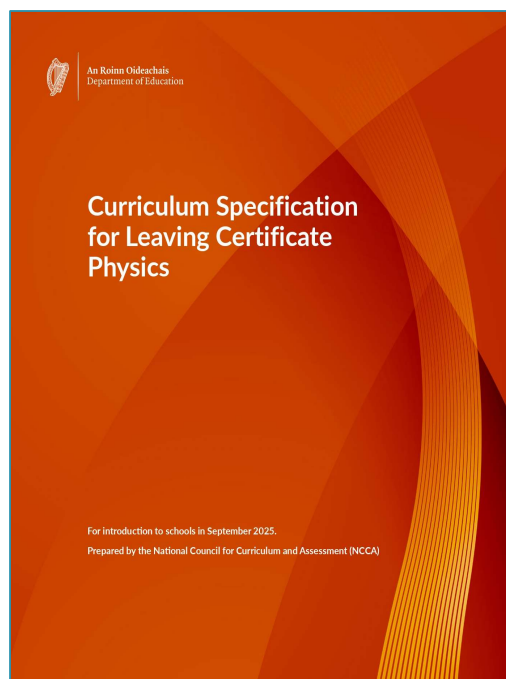
Take out the coursework rules and procedures doc (I have put it on slide 21) as we engage with this regularly.
Can you also add the L2LP doc to the this as key supporting doc.

Helen Van Eesbeck, 2026-05-18T08:53:20.011



Oide

Key Supporting Documents



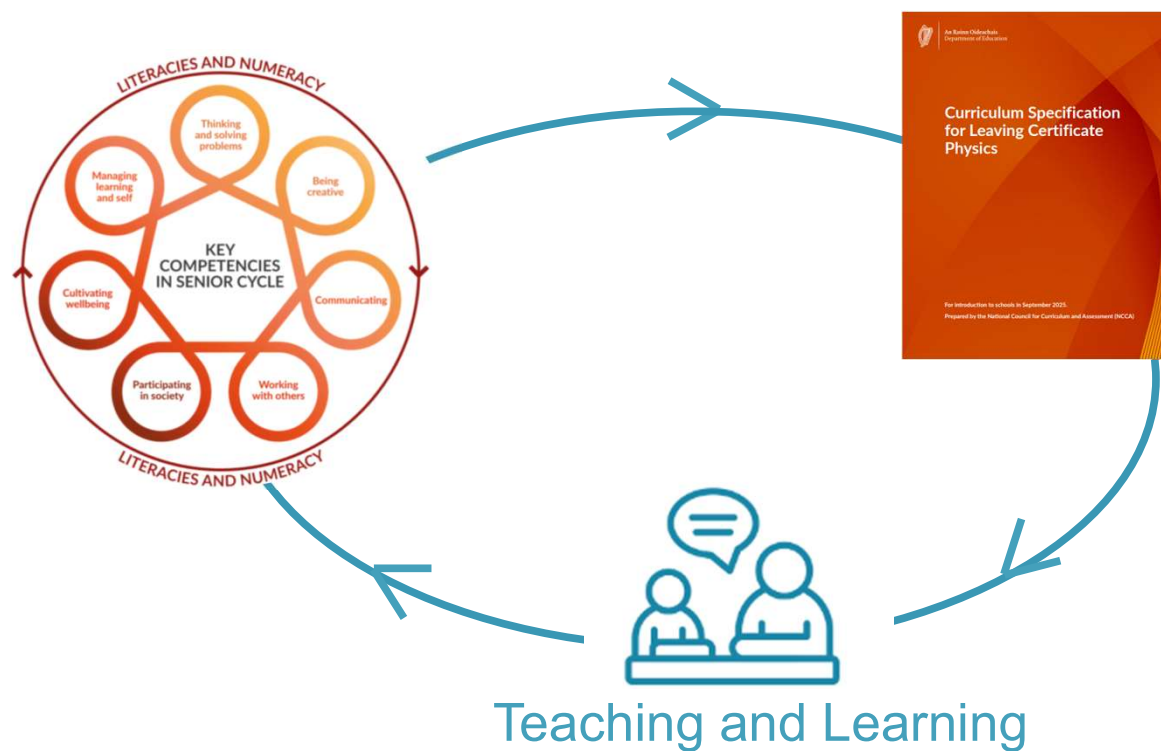
Tacú leis an bhFoghlaim
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Key Competencies



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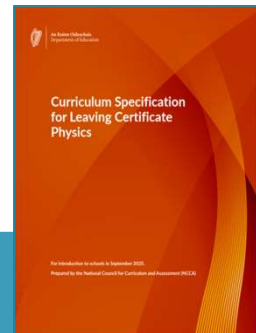
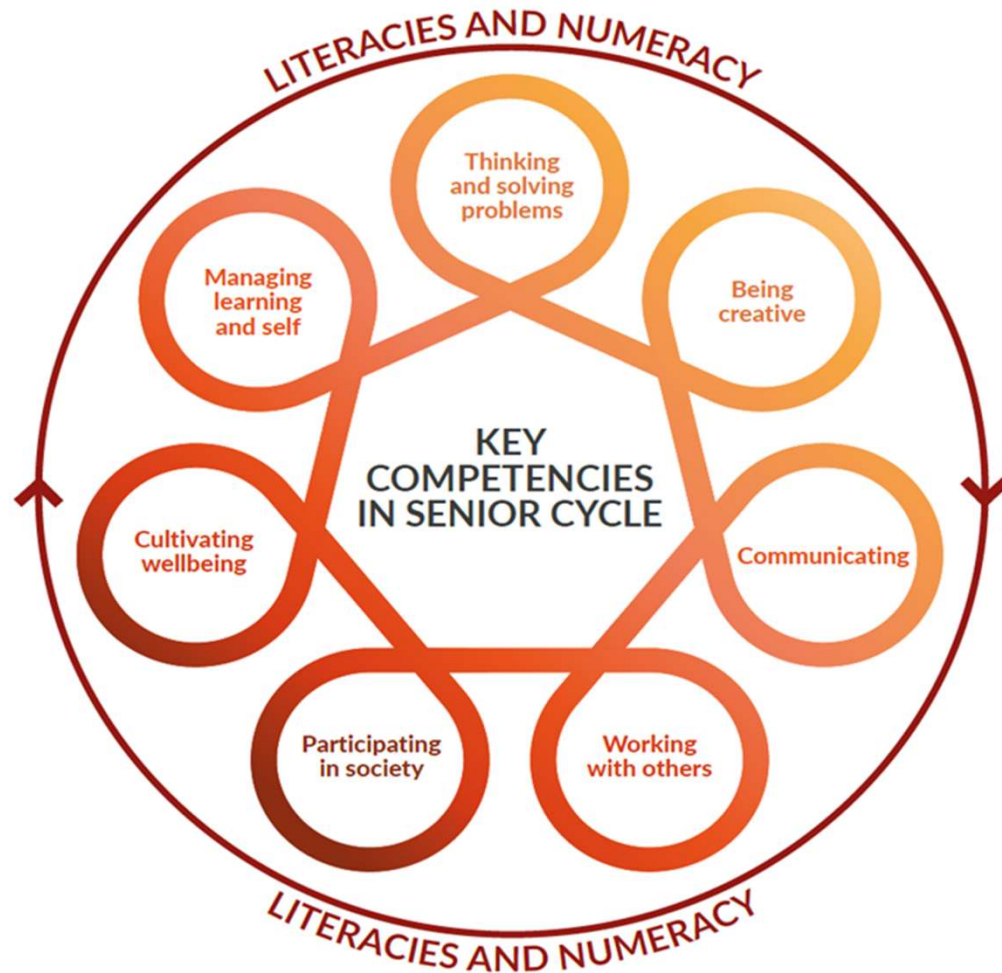
Tacú leis an bhFoghlaim
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Key Skills from Junior Cycle



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“All of the key skills developed across the curriculum during junior cycle support student learning in senior cycle.”

(NCCA, p.5)

Key Competencies



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‘encompassing established facts, concepts, ideas and theories’, including ‘theoretical concepts and ideas as well as practical understanding based on the experience of having performed certain tasks’¹

KNOWLEDGE

‘the ability and capacity to carry out processes and to be able to use one’s knowledge in a responsible way to achieve one’s goal’²

SKILLS

‘the beliefs that a person holds about what is desirable – for themselves and for society more generally’³

VALUES AND DISPOSITIONS

‘the tendency for a person to act in a certain way in given circumstances’³

1: OECD (2019), *Future of Education and Skills 2030*, [Concept note: knowledge for 2030](#), p3.

2: OECD (2019), *Future of Education and Skills 2030*, [Concept note: skills for 2030](#), p4.

3: McGuinness, C. (2018), *Research-Informed Analysis of 21st Century Competencies in a Redeveloped Primary Curriculum*, NCCA research report

Enriched, engaged
and
competent learners



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*A Will
- and -
A Skill*

KNOWLEDGE

SKILLS

VALUES AND DISPOSITIONS

1: OECD (2019), *Future of Education and Skills 2030*, [Concept note: knowledge for 2030](#), p3.

2: OECD (2019), *Future of Education and Skills 2030*, [Concept note: skills for 2030](#), p4.

3: McGuinness, C. (2018), *Research-Informed Analysis of 21st Century Competencies in a Redeveloped Primary Curriculum*, NCCA research report



Aims of Leaving Certificate Physics

- to build knowledge and understanding of specified core concepts and fundamental principles of physics
- to develop the skills, values and dispositions needed to apply this knowledge to explain, analyse, solve problems and predict events in a variety of systems and interactions in the physical world
- to demonstrate inquiry and practical skills consistent with the principles and practices of physics
- understand how society and science are interwoven, the everyday relevance and the ethical implications of physics.

Physics Specification, pg. 4

Key Messages



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Purposeful subject planning supports effective student engagement with the Physics specification's learning outcomes which enables students to develop scientific skills that can be applied to a range of tasks in both familiar and unfamiliar contexts

Investigative experiences help students move from concrete engagement with phenomena, to symbolic representation through data, graphs and models, and towards abstract understanding.

Productive struggle supports students in applying familiar physics ideas in unfamiliar contexts, while helping teachers identify misconceptions and next steps for learning.



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Supporting the Professional
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Session 1

Reflection and thematic planning





Participant Learning Intentions for Session 1

- explore engaging approaches to thematic planning (UoL) when designing learning experiences in Leaving Certificate Physics
- consider how learning outcomes from the specification can be connected through meaningful concepts
- identify opportunities within activities to support the development of scientific skills and key competencies



Why begin with reflection?

Reflection helps us to:

- identify strengths
- recognise challenges
- clarify progression
- inform deliberate planning



Professional reflection strengthens professional judgement



Reflection: Progress to Date

Think-Pair-Share

- Where do my students demonstrate autonomy?
- What challenges have arisen around sourcing primary data and how did you overcome them?
- What skill/s from the unifying strand have my students' progressed well in?



From Reflection to Planning

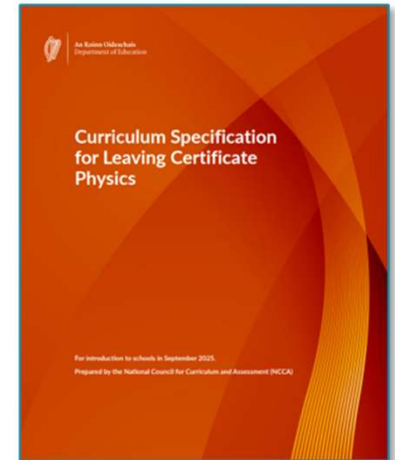
effective implementation requires:

- coherent integration of strands

“The Nature of Science underpins physics and so is considered a unifying strand; it permeates all the strands of the specification.”



Oide



(NCCA, 2024)
p.10



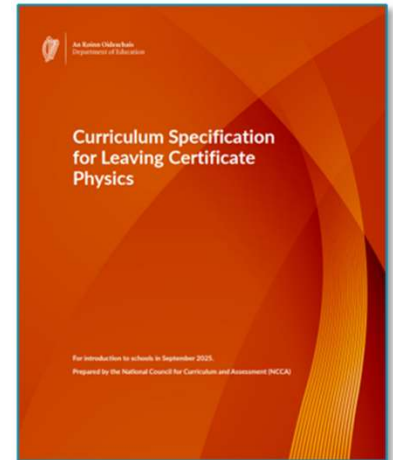
Oide

From Reflection to Planning

Effective implementation requires:

- coherent integration of strands
- planned skill progression

“Leaving Cert physics aim to develop the skills, values and dispositions needed to apply knowledge to explain, analyse, solve problems and predict events in a variety of systems and interactions in the physical world. “



(NCCA, 2024)
p.4

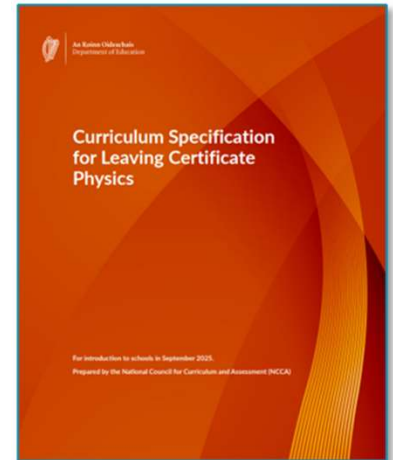


From Reflection to Planning

Effective implementation requires:

- coherent integration of strands
- planned skill progression
- intentional primary data opportunities

“Whilst contextual strands set out situations where students are required to gather primary data ..., this is a minimum requirement and it is not expected that practical opportunities would be limited to these situations.”



(NCCA, 2024)
p.29

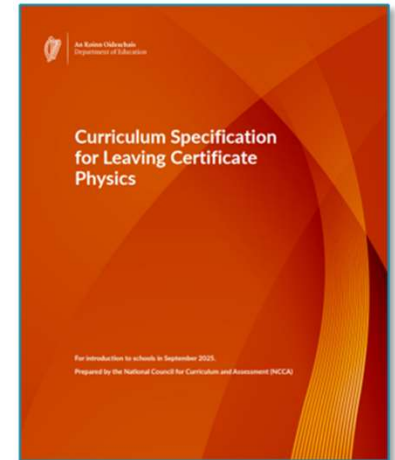


Oide

From Reflection to Planning

Effective implementation requires:

- coherent integration of strands
- planned skill progression
- intentional primary data opportunities
- movement from familiar to unfamiliar contexts



(NCCA, 2024)
p.11

“They identify and apply skills and knowledge in a wide variety of both familiar and unfamiliar contexts.”

Thematic Planning (UoL) in Leaving Certificate Physics

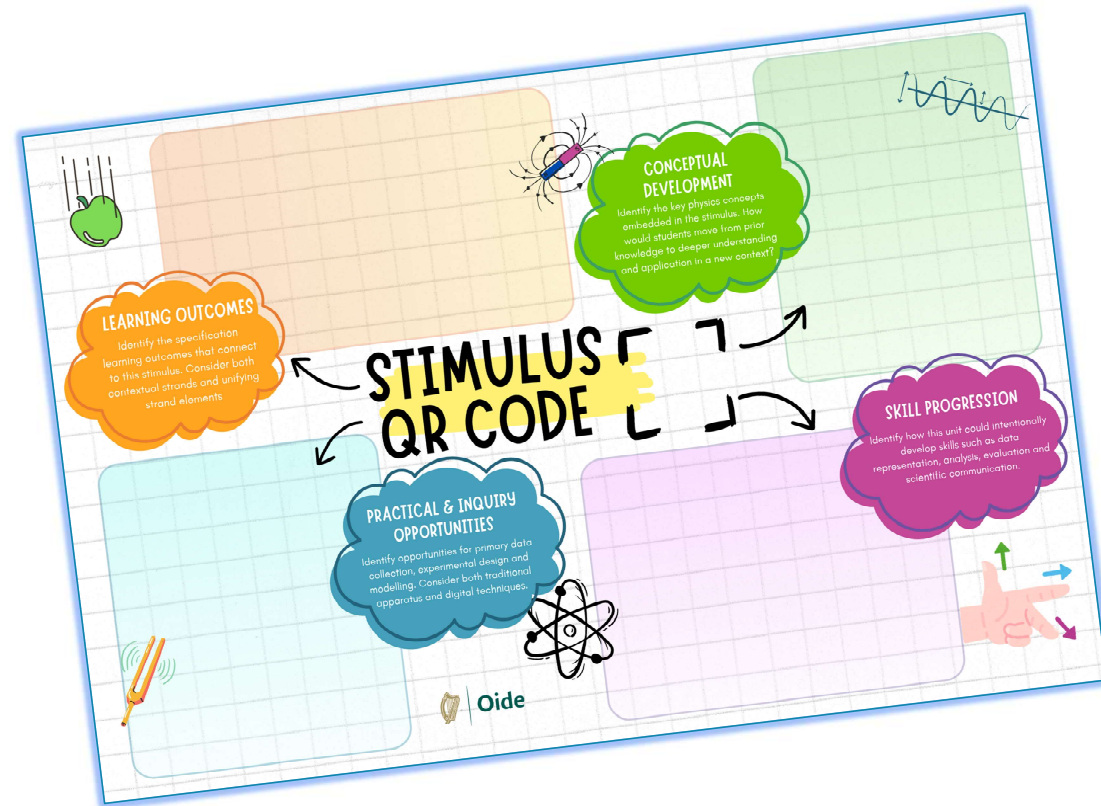


Oide

Around the stimulus

1. Relevant Learning Outcomes
2. Conceptual Development
3. Practical & Inquiry Opportunities
4. Skill Progression

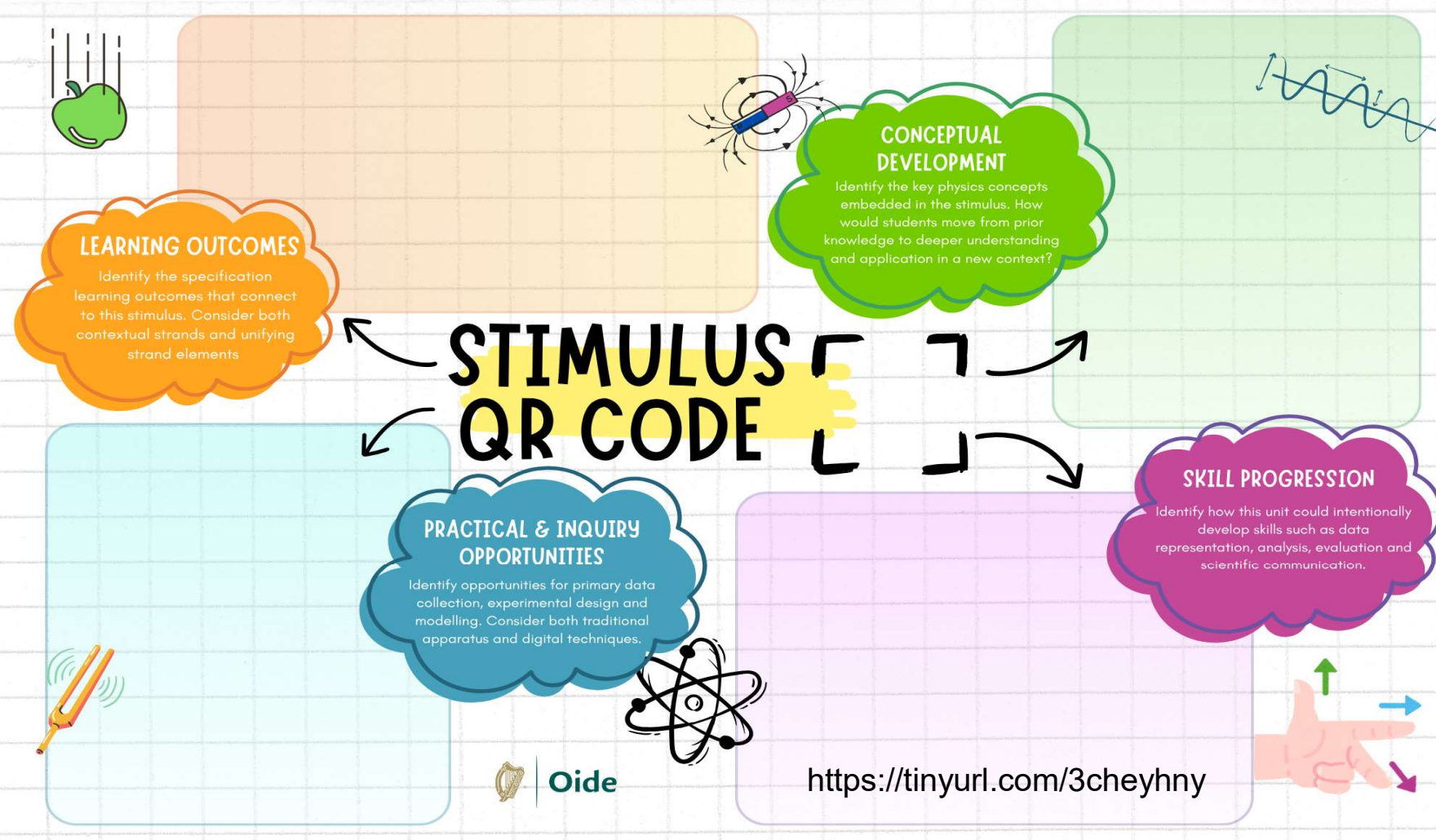
Design for coherence, not coverage.



Thematic Planning (UoL)



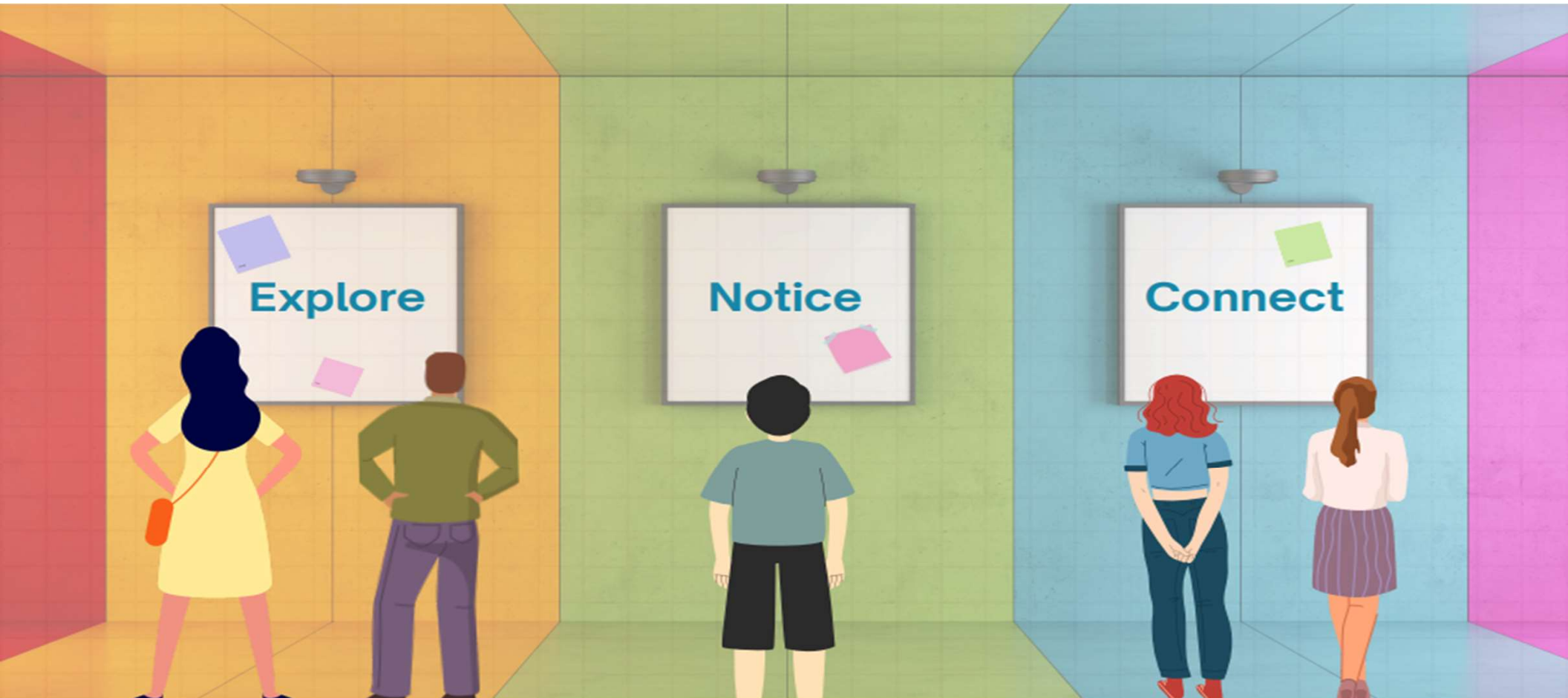
Oide



Gallery Walk, Feedback, Reflection



Oide





Participant Learning Intentions for Session 1

At the end of this session participants have:

- explored engaging approaches to thematic planning (UoL) when designing learning experiences in Leaving Certificate Physics
- considered how learning outcomes from the specification can be connected through meaningful contexts
- identified opportunities within activities to support the development of scientific skills and key competencies



Tea/Coffee Break





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Session 2

Investigating Physics:
From Concrete Experience to Scientific Understanding





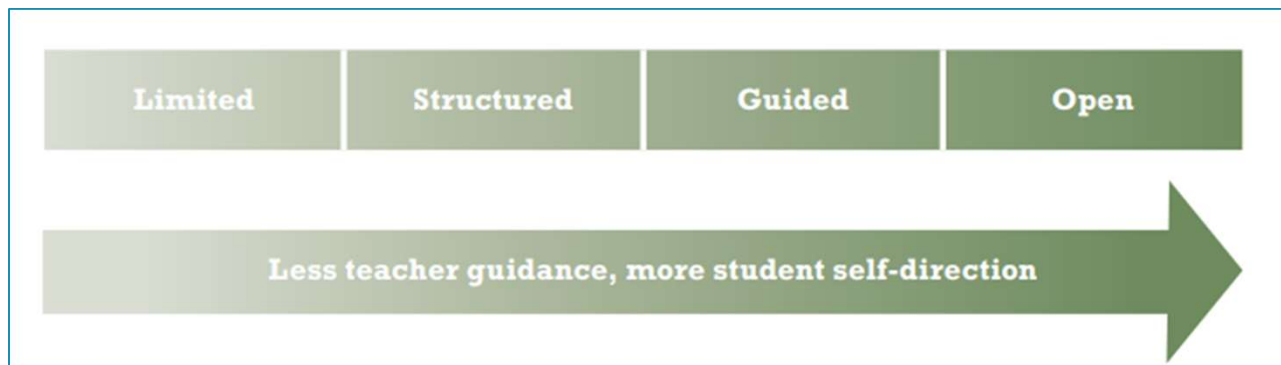
Participant Learning Intentions for Session 2

By the end of this session participants will:

- consider how students move from concrete experience to understanding data, graphs and models
- identify opportunities for students to collect, represent and interpret data across the specification
- Reflect on how investigations support students' engagement with learning outcomes while enabling them to apply knowledge and skills in both familiar and unfamiliar contexts.



Investigation and the Continuum of Inquiry



Junior Cycle Science Specification, 2015, p. 14

“Teachers are best positioned to make professional judgements on how to develop these skills with their students through an appropriate balance of explicit instruction and inquiry-based approaches”

(NCCA, 2024)



Unifying Strand – Working like Scientists

“As they learn to work like scientists, they develop a habit of mind that sees them rely on a set of established procedures and practices associated with scientific inquiry to gather evidence, generate models and test their ideas. It becomes apparent that the process of science is often complex and iterative, following many different paths.”

(NCCA, p.12)



Investigating to Build Understanding

“Whilst contextual strands set out situations where students are required to gather primary data ... this is a minimum requirement and it is not expected that practical opportunities would be limited to these situations.”
NCCA, p. 29

“Digital technology can enhance learning, teaching and assessment, creating opportunities for students to develop scientific knowledge and skills ... and to collect, record, analyse and display data and information appropriately”

(NCCA, p.30)



Investigating to Build Understanding

“Whilst contextual strands set out situations where students are required to gather primary data ... this is a minimum requirement and it is not expected that practical opportunities would be limited to these situations.”

NCCA, p. 29

“students will learn more about the nature of investigation through research and experimentation.”

NCCA, p. 32

Investigate

observe, study, or make a detailed and systematic examination, in order to establish facts and reach new conclusions



From Experience to Understanding

Students may move through

Concrete

- hands-on experience of a phenomenon

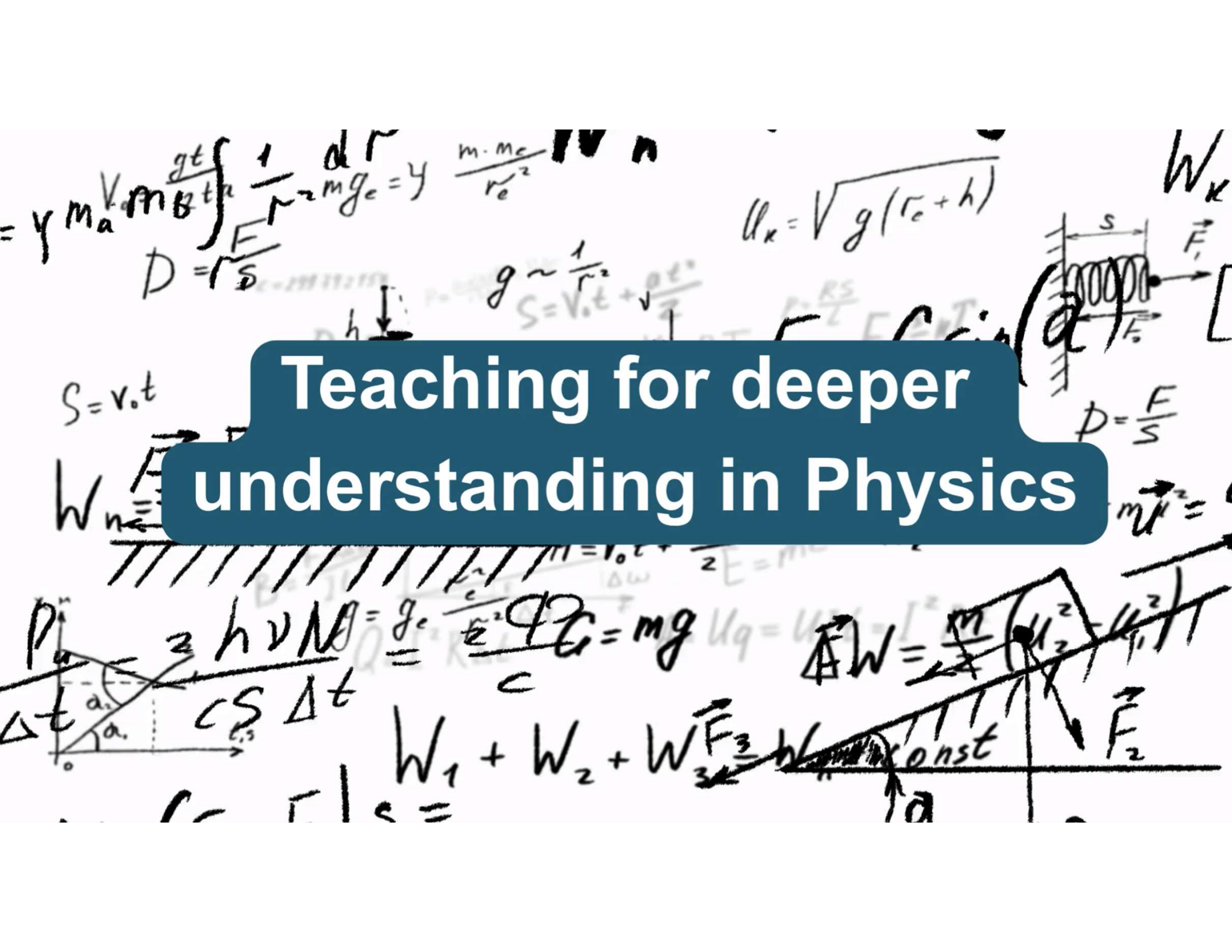
Symbolic

- data, graphs, diagrams, equations

Abstract

- explanation, prediction, unfamiliar contexts



The background of the image is a collage of handwritten physics notes and diagrams. At the top left, there's an integral equation: $\int \frac{1}{r^2} dr = \frac{1}{-r} = -\frac{1}{r}$, with $\frac{gt}{2}$ and $\frac{m \cdot m_c}{r_c^2}$ written nearby. To its right is $u_k = \sqrt{g(r_c + h)}$. Below the integral is $D = \frac{F}{S}$. In the center, $g \sim \frac{1}{r^2}$ and $S = v \cdot t + \frac{gt^2}{2}$. On the right, there's a diagram of a spring with forces $\vec{F}_1$ and $\vec{F}_2$, and a displacement s . Below that is $D = \frac{F}{S}$. At the bottom left, there's a graph of p_a vs Δt with a linear relationship and slope a . Next to it is $2 h \nu M = \frac{g_c}{c} \frac{e^2 q^2}{2} = mg$. To the right of that is $W_1 + W_2 + W_3 = W_{\text{const}}$. At the bottom right, there's a diagram of a person on a seesaw with forces $\vec{F}_1$ and $\vec{F}_2$, and a formula $\Delta W = \frac{m}{2} (u_2^2 - u_1^2)$.

Teaching for deeper understanding in Physics

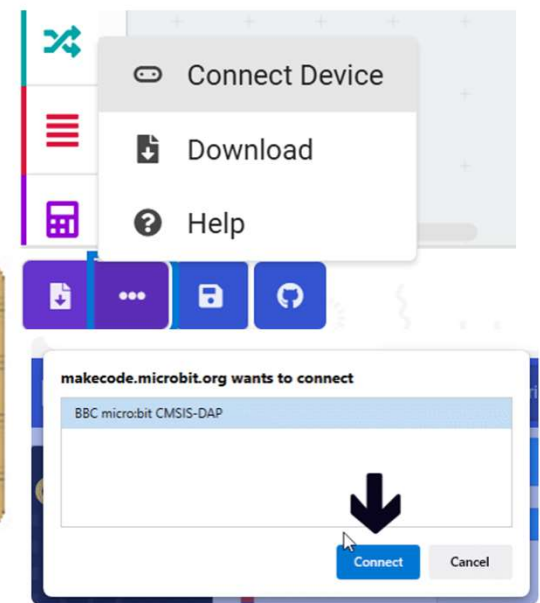


Investigation Stations: Equipment as a Route to Evidence

<https://tinyurl.com/oidemicrobit>



For tablets only





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Investigation Stations

At each station:

- explore the phenomenon
- collect or consider evidence
- represent the relationship
- link to learning outcomes
- consider the next step in understanding





Reflection

1. Which learning outcomes (contextual and unifying strands) could students engage with during these activities?
2. How could these activities support progression from concrete experience to symbolic representation and abstract understanding?
3. How could these activities promote student engagement?





Participant Learning Intentions for Session 2

At the end of this session participants have:

- consider how students move from concrete experience to data, graphs and models
- identify opportunities for students to collect, represent and interpret data across the specification
- Reflect on how investigations support students' engagement with learning outcomes while enabling them to apply knowledge and skills in both familiar and unfamiliar contexts.

Lunch



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Session 3

Supporting Productive Struggle:

Applying Knowledge and Skills from Physics in Familiar and
Unfamiliar Contexts





Participant Learning Intentions for Session 3

By the end of this session participants will:

- explore how productive struggle can support students in developing deeper conceptual understanding
- consider how students can be supported to apply physics knowledge and skills in familiar and unfamiliar contexts
- anticipate possible student responses, misconceptions and gaps in understanding during practical and data-based tasks
- reflect on how teacher questioning can support learning without removing the challenge

Productive Struggle

Consider how graphs connect to equations

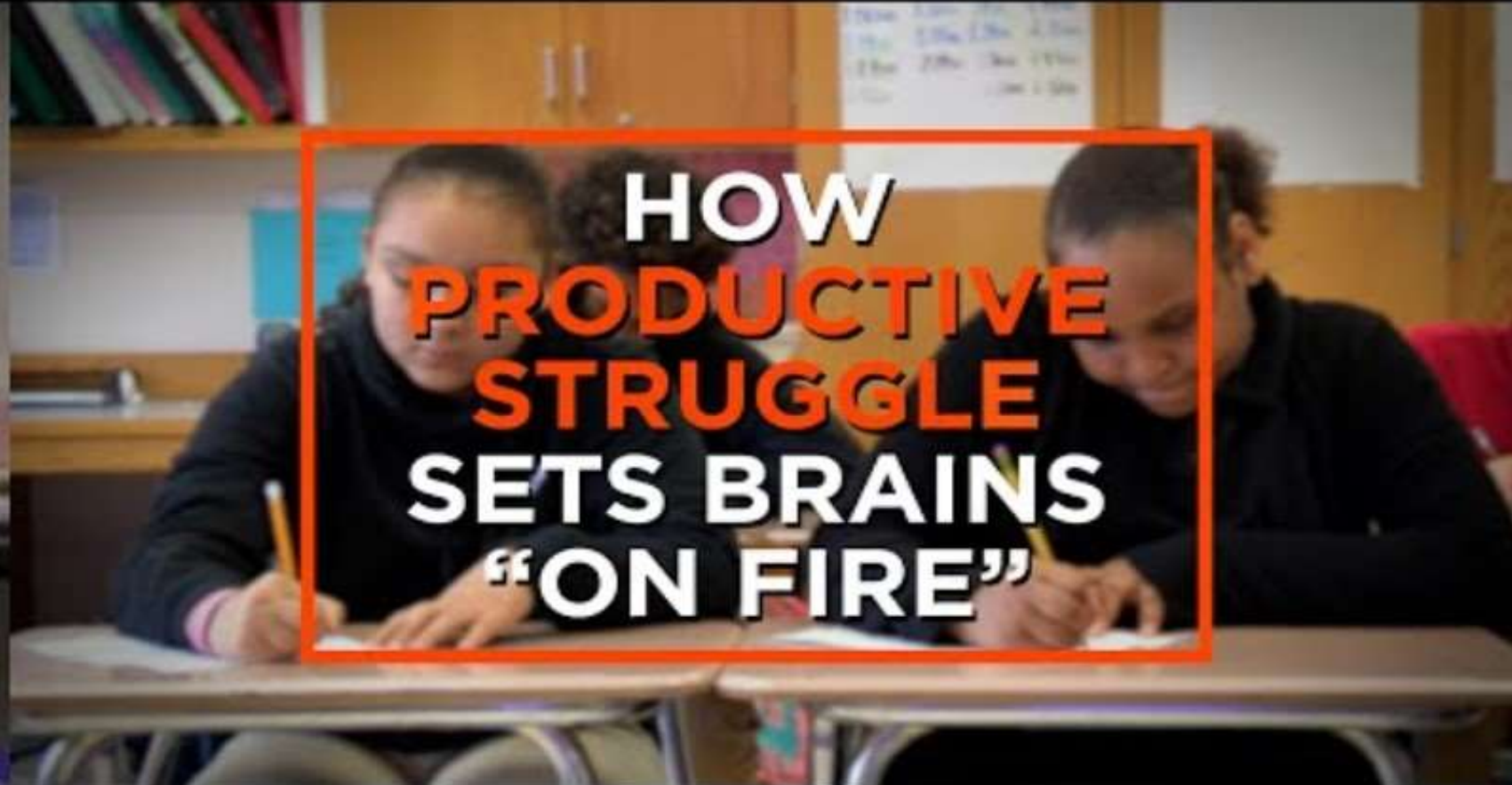
Resource is adapted from:
<https://isaacscience.org/>



<https://tinyurl.com/3vftbker>



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A photograph of two students, a girl and a boy, sitting at a wooden desk in a classroom. They are both focused on their work, with the girl on the left holding a pencil and the boy on the right writing. The background shows a bookshelf and a whiteboard. The text is overlaid on the center of the image, enclosed in an orange rectangular border.

**HOW
PRODUCTIVE
STRUGGLE
SETS BRAINS
“ON FIRE”**

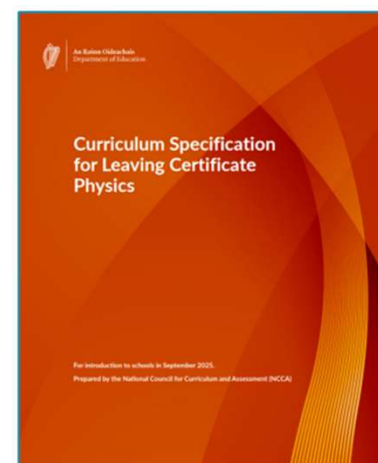


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Teaching for Student Learning

“By setting appropriate and engaging tasks, of varying cognitive demand and giving feedback that promotes learner autonomy, assessment will support learning as well as summarising achievement”

“As well as varied teaching strategies, varied assessment strategies will support learning and provide information that can be used as feedback so that teaching and learning activities can be modified in ways that best suit individual students.”



(NCCA, 2024)
p.30

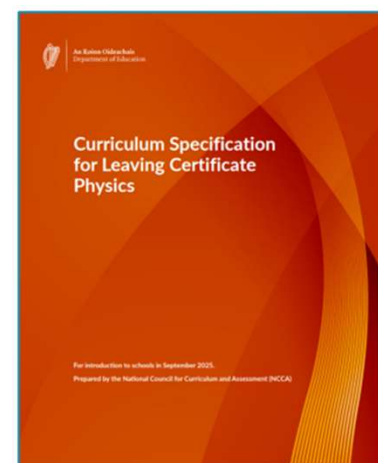


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From Familiar to the Unfamiliar

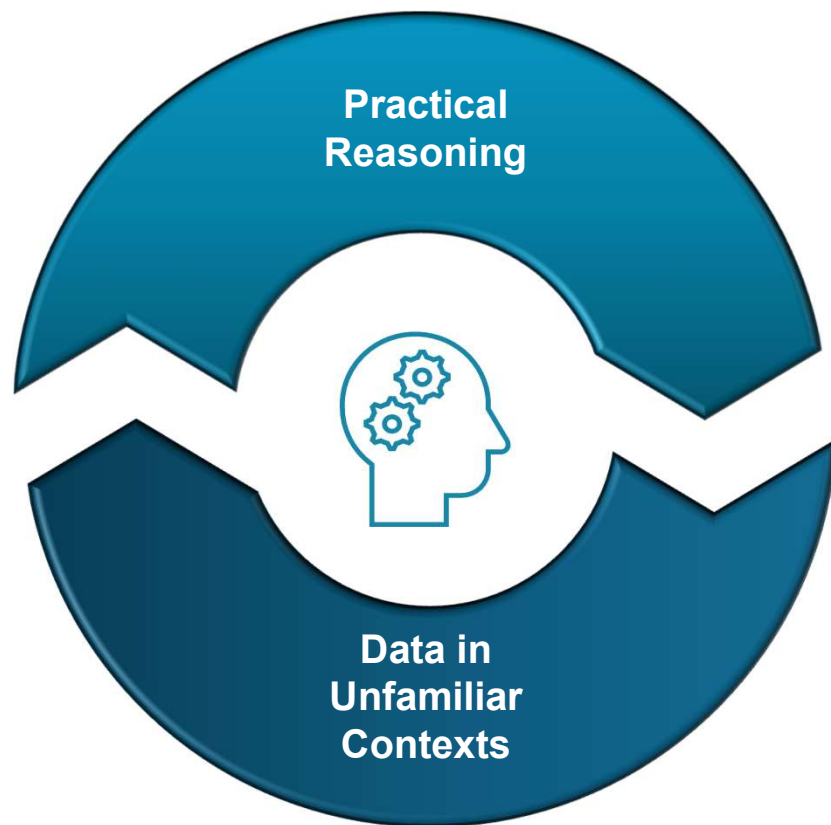
“Leaving Cert Physics aims to develop the skills, values and dispositions needed to apply knowledge to explain, analyse, solve problems and predict events in a variety of systems and interactions in the physical world”

“Students should be able to identify and apply skills and knowledge in a wide variety of both familiar and unfamiliar contexts.”



(NCCA, 2024)
p.4 and p.11

Familiar Content in Unfamiliar Contexts | Oide



Circulate through 2 stations

Rotate every 25 minutes.

Slide 53

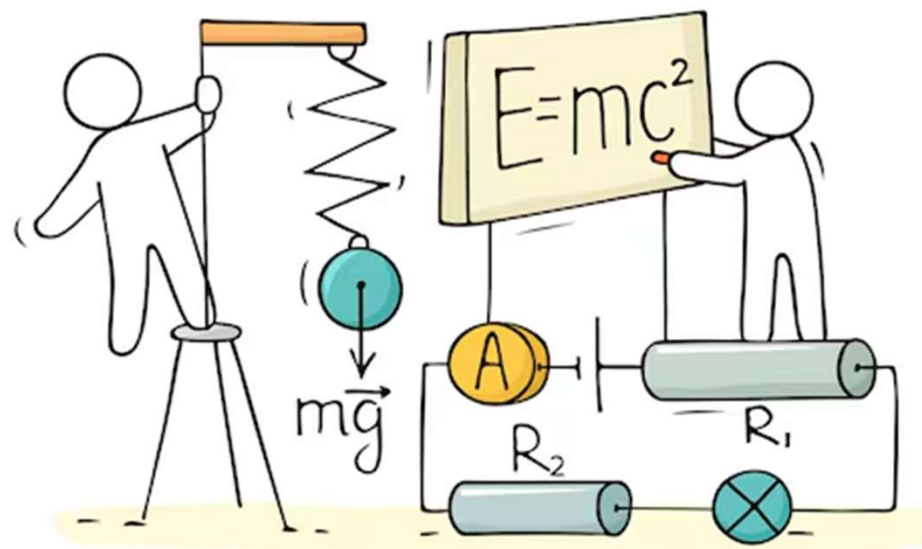
- HE1** Will each of these tasks be in the workbook? If they are engaging with them (even as a group) would they a copy of each one themselves to think about it and make notes?
Helen Van Eesbeck, 2026-05-26T11:49:36.790
- AM1 0** [@Helen Van Eesbeck] the tasks are too long for the workbook but the teacher part thinking about possible student answers/what that tells us and the possible prompts we could use are in the workbook
Alice Mooney, 2026-05-26T11:54:48.036
- TT1 1** the sheets will also be on the padlet so they can engage there if they prefer.
Tom Tierney, 2026-05-26T12:09:53.059



Station 1 – Practical Reasoning

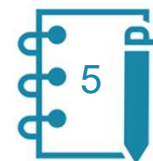
Students may be asked to:

- identify what is wrong
- suggest improvements
- justify decisions
- predict the effect of errors



Teacher focus:

- **What might student responses reveal?**





Station 2 – Data in Unfamiliar Contexts

Students may be asked to:

- identify patterns
- choose a graph
- test relationships
- suggest possible physical contexts

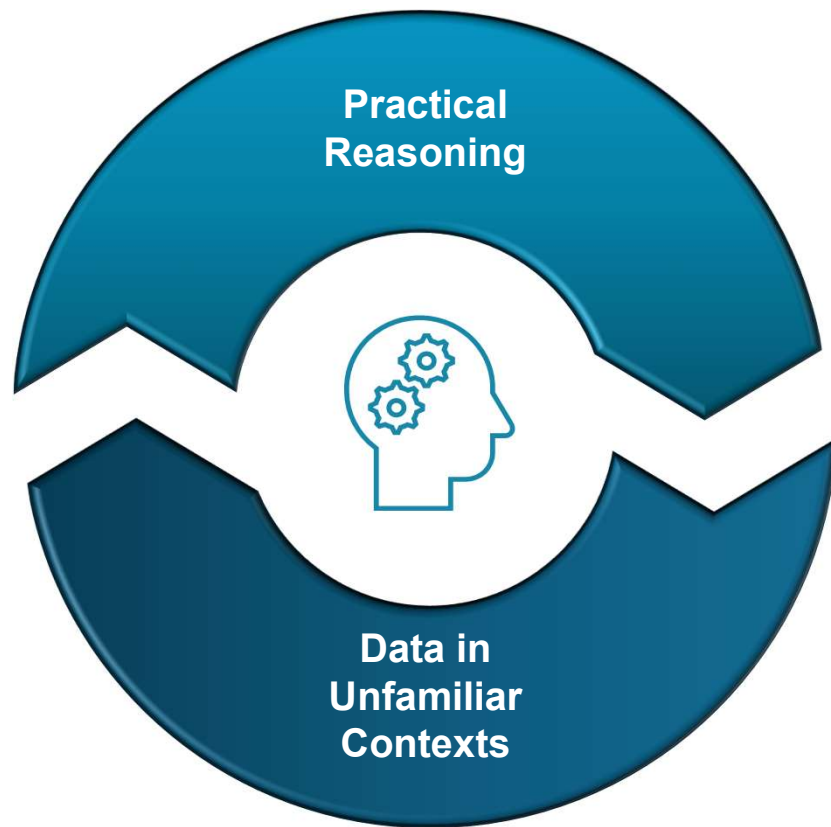


Teacher focus:

- **How do students transfer familiar ideas?**



Familiar Content in Unfamiliar Contexts | Oide



Circulate through 2 stations

Rotate every 25 minutes.



Reflection after Stations

Discuss in groups:



What misconceptions might student responses reveal?

What teacher questions could move learning forward?

How did the tasks support transfer from familiar to unfamiliar contexts?

Slide 57

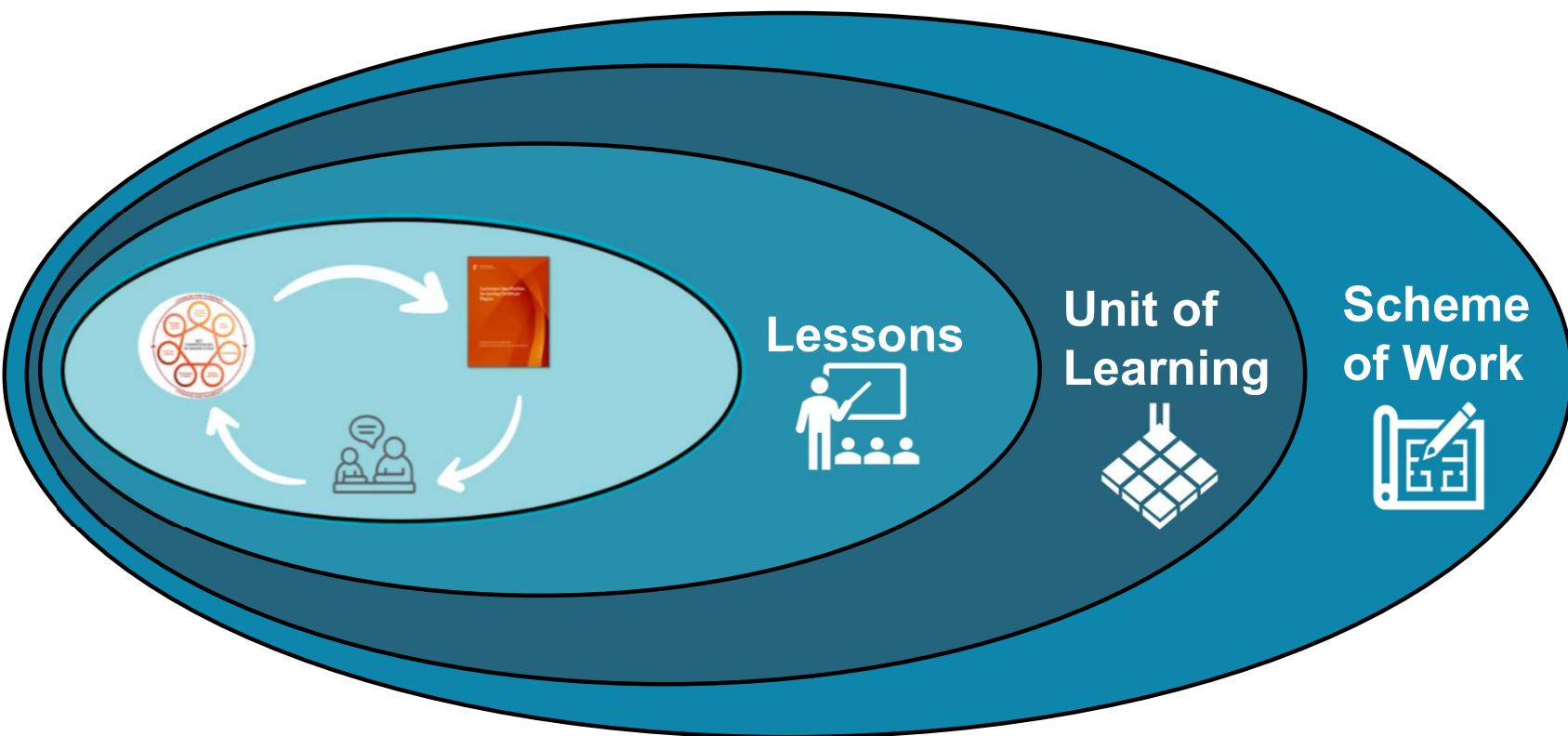
HE1

Is this just a discussion? Do the teachers write down answers etc - make this clear in the speaker notes so it is clear how this will be facilitated

Helen Van Eesbeck, 2026-05-26T11:51:21.134



Planning in Physics



KEY CONSIDERATIONS FOR UNITS OF LEARNING IN PHYSICS

SUBJECT SCHEME OF WORK

The overall curriculum plan guiding teaching & learning

- Outlines sequencing across the year
- Identifies key assessment moments
- Reflects whole school activities
- Adapted for opportunities to link to real world events

UNIT OF LEARNING (UoL)

The building blocks of curriculum you are teaching

- Connects learning outcomes to classroom practice
- Shapes learning experiences, assessments, and skills development
- Adapted to suit specific student cohorts and contexts

INDIVIDUAL LESSON PLANNING

Responsive classroom practice informed by the Unit of Learning

- Daily learning experiences and activities
- Ongoing assessment and feedback
- Adjusted based on student needs and progress.

REFLECTION

Teacher and department reflection. What worked well? Student feedback & assessment evidence. How might learning be improved?

STUDENT VOICE

Listen to learners, value their feedback and involve them in the learning process

FUTURE PLANNING

Use insights to inform and improve future Units of Learning

MAKE ADJUSTMENTS

Adapt strategies, resources and assessments based on student strengths, needs and progress

CROSS-CUTTING THEMES

Health Technology Sustainability

PRIOR KNOWLEDGE & LEARNING CONNECTIONS

To include:

- Junior Cycle knowledge
- Progression to Senior Cycle Competencies
- Cross-curricular links that complement learning

LEARNER EXPERIENCES

To include:

- Suitable methodologies
- Purposeful learning strategies
- Resources available
- Tasks and activities appropriate to the learning outcome

UNIT OF LEARNING

- Learning Outcomes
- Action Verbs
- Key Learning

IDENTIFY AND REMOVE BARRIERS

Support all learners:

- multiple representations
- varied responses
- offer choice
- relevance
- real world connections

EVIDENCE OF LEARNING

To include:

- How can students show their learning?
- Formative and summative
- Alignment to learning outcomes & action verb
- How do we know the student has developed understanding?

SKILLS PROGRESSION

Consider:

- Build on Junior Cycle Skills
- Continuum of Inquiry
- Build student agency and confidence
- Progression of scientific practices and thinking



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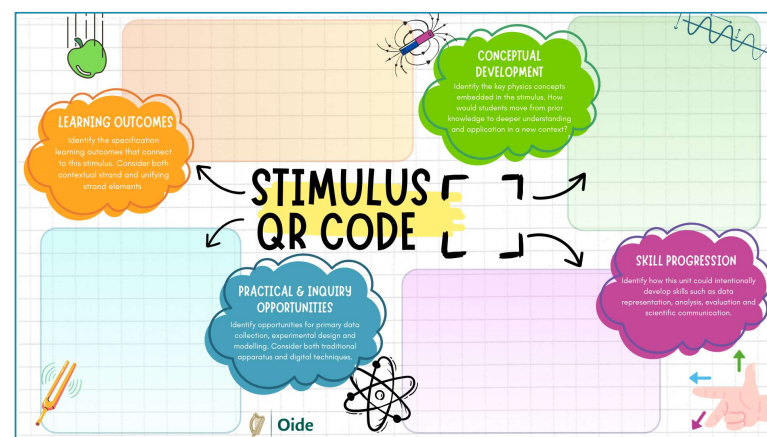
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Revisiting Your Planning

Revisit your plan from session 1.

Where could your unit of learning:

- create productive challenge?
- support transfer to unfamiliar contexts?
- build confidence with data, models or practical reasoning?





Participant Learning Intentions for Session 3

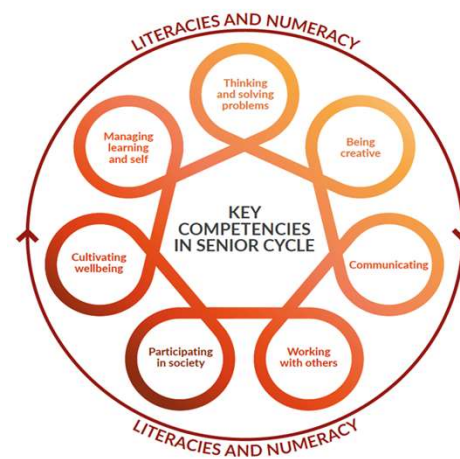
At the end of this session participants have:

- explore how productive struggle can support students in developing deeper conceptual understanding
- consider how students can be supported to apply physics knowledge and skills in familiar and unfamiliar contexts
- anticipate possible student responses, misconceptions and gaps in understanding during practical and data-based tasks
- reflect on how teacher questioning can support learning without removing the challenge



Reflection

How might planning, practical work and teacher questioning explored today support student learning in your classroom?



Slide 62

HE1 Is there space for them to do this in the workbook?

Helen Van Eesbeck, 2026-05-26T11:53:23.369

AM1 0 [@Helen Van Eesbeck] we are at 8 pages in workbook. We took this more as a personal reflection moment for teachers

Alice Mooney, 2026-05-26T12:06:01.355

Key Messages



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Purposeful planning supports engagement with the learning outcomes outlined in the Leaving Certificate Physics specification, enabling students to develop scientific skills that can be applied to a range of tasks in both familiar and unfamiliar contexts.

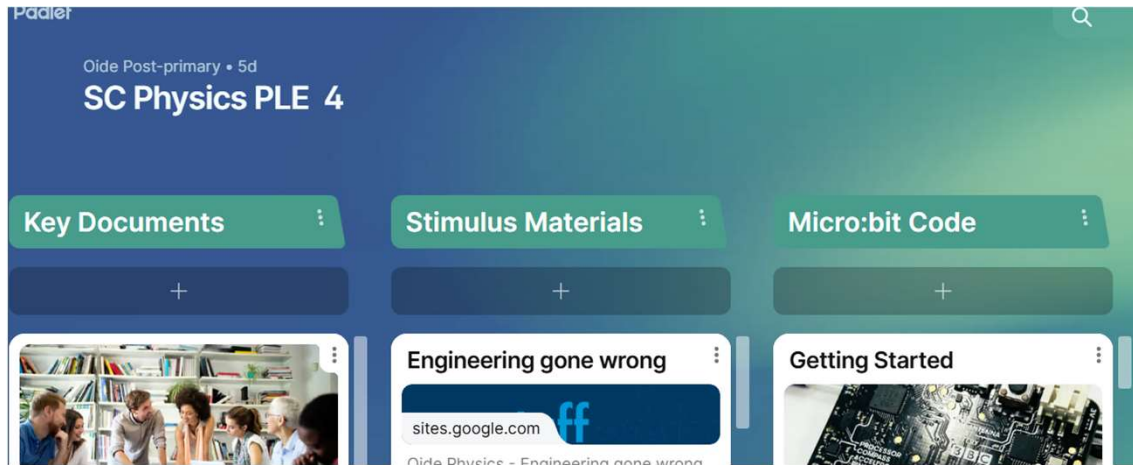
Investigative experiences help students move from concrete engagement with phenomena, to symbolic representation through data, graphs and models, and towards abstract understanding.

Productive struggle supports students in applying familiar physics ideas in unfamiliar contexts, while helping teachers identify misconceptions and next steps for learning.

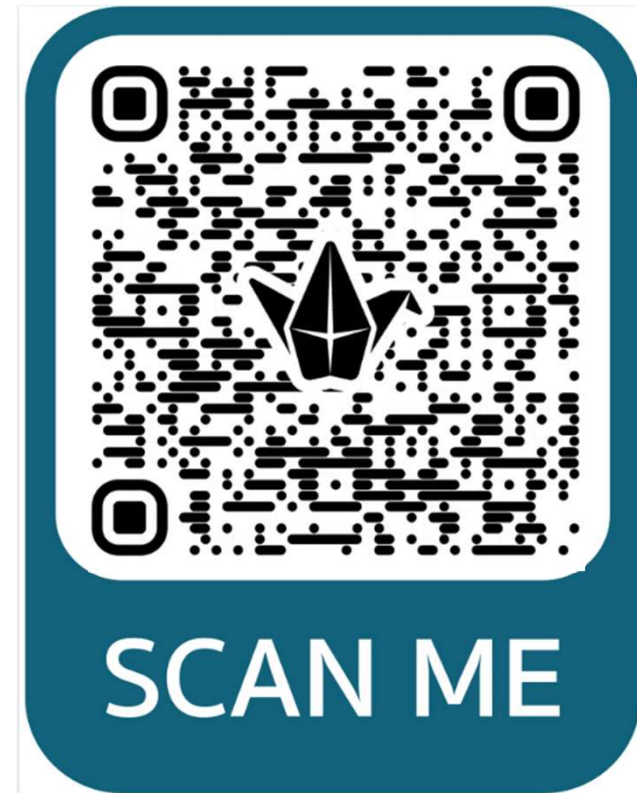
Achmhainní/Resources



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www.scoilnet.ie

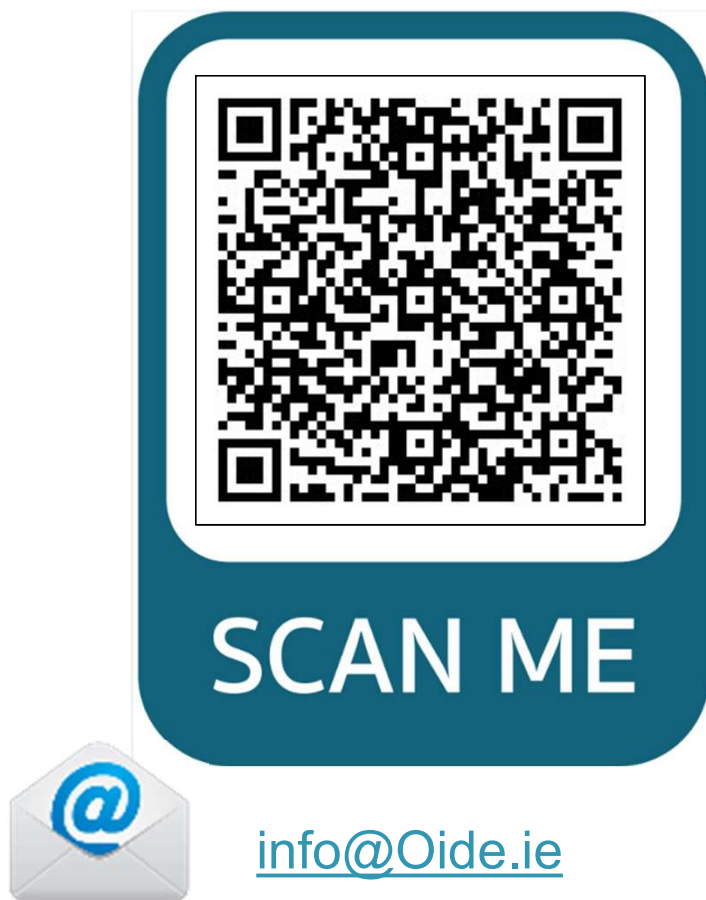


<https://tinyurl.com/yp5m76y9>

Déan Teagmháil/Keep in Touch



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Aiseolas/Feedback



Sitting No.

<https://bit.ly/ple4feedback>