Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE 2023/2024



Meet the Team - Applied Technology





Seán KehoeProfessional Learning Leader



Fergal Murphy
Professional Learning Leader





Barry Nolan Senior Leader



Partners



An Roinn OideachaisDepartment of Education

www.education.ie



Coimisiún na Scrúduithe Stáit State Examinations Commission

www.examinations.ie



NCCA

An Chomhairle Náisiúnta Curaclaim agus Measúnachta National Council for Curriculum and Assessment

www.ncca.ie





Key Website / Online information

www.curriculumonline.ie

www.ncca.ie

www.oide.ie

% @Oide_PP_Tech4

E: info@oide.ie





Oide Mailing List

Resources





www.jct.ie



www.oide.ie



www.scoilnet.ie



www.t4.ie



PLE Supports



Professional Learning Booklet



Activities and Group Discussion



Practical Learning Experiences

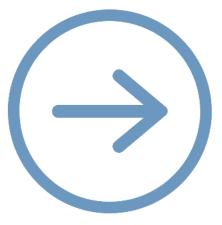


Teacher Testimonials



Pause and Reflect





How did this inform the design of today's PLE workshop?

What is new in Applied Technology?



PLE 2022/2023 - Feedback



Project/task design

Planning and pedagogy

Practical element

Documenting and acting on learning

Professional collaboration

Support with mechanisms



Themes for Today



Evolving Practice



Focus on Learning

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE 2023/2024

Session 1





In this session, we will...



Consider how our practice is evolving in the implementation of the Applied Technology specification



Explore what a student-centred approach looks like in the design of learning experiences











Pg. 2



- Introduce yourself to colleagues at your table
- Share one positive learning experience that your students had in Applied Technology this year



Open Floor Discussion



Share **one positive learning experience** that your students had in Applied Technology this year

Implementing the Applied Technology Specification - The Journey so far...

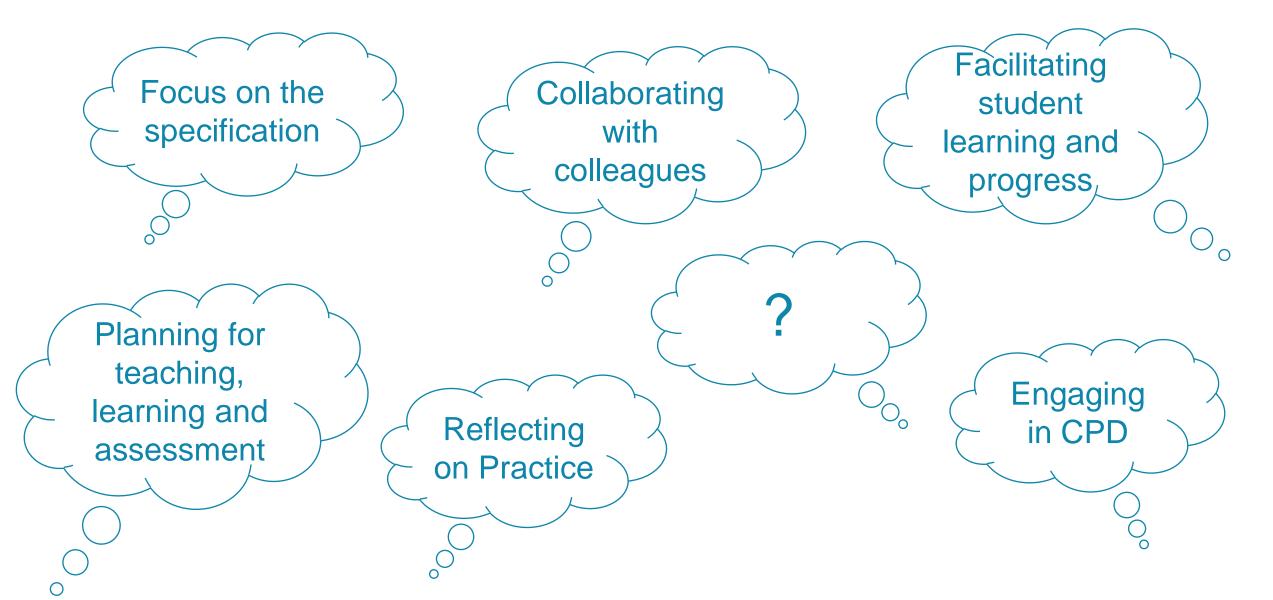




What does an Evolving Practice look like?

What does an Evolving Practice look like?









Personal Reflection Moment

How can my practice evolve further to support student learning?



Let's consider the approach of an Applied Technology Department





Mike, Andrew and Sarah, St. Oliver's Community College



St. Oliver's Community College, Drogheda





St. Oliver's Community College

Context:

- 1400 students approx. in the school
- Large Applied Technology
 Department 5 teachers
- New and experienced teachers



Mike, Andrew and Sarah, St. Oliver's Community College



Evolving our Practice





Pg. 3

In implementing the new subject specification, how is your practice evolving to support student learning?

In implementing the subject specification, how is your practice evolving to support student learning?



Group Feedback & Discussion





In implementing the subject specification, how is your practice evolving to support student learning?



Evolving our Practice











- Three points you took from this discussion
- Two actions you will take on return to your subject department
- One way that you will measure your progress



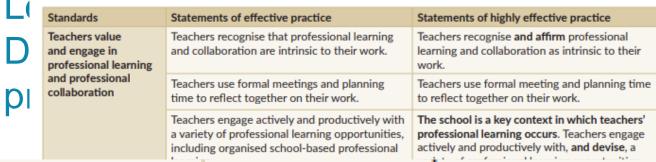
Looking at Our School 2022



Looking at Our School 2022: A Quality Framework for Post-Primary Schools

August 20





ative

Teachers view collaboration as a means to improve student learning and also to enhance their own professional learning. They engage in constructive collaborative practice. Teachers view collaboration as a means to improve student learning and also to enhance their own professional learning. They engage in constructive collaborative practice, and in collaborative review of their practice.



respectful relationships with colleagues and school management for the benefit of students' learning, and for the wellbeing of staff and students. Teachers are also mindful of and take responsibility for their own wellbeing.

further develop positive and respectful relationships with colleagues and school management for the benefit of students' learning, and for the wellbeing of staff and students. Teachers are also mindful of, actively attend to and take responsibility for their own wellbeing.

Teachers implement whole-school approaches to learning and teaching that include the use of online platforms and other digital technologies to improve students' experiences and outcomes.

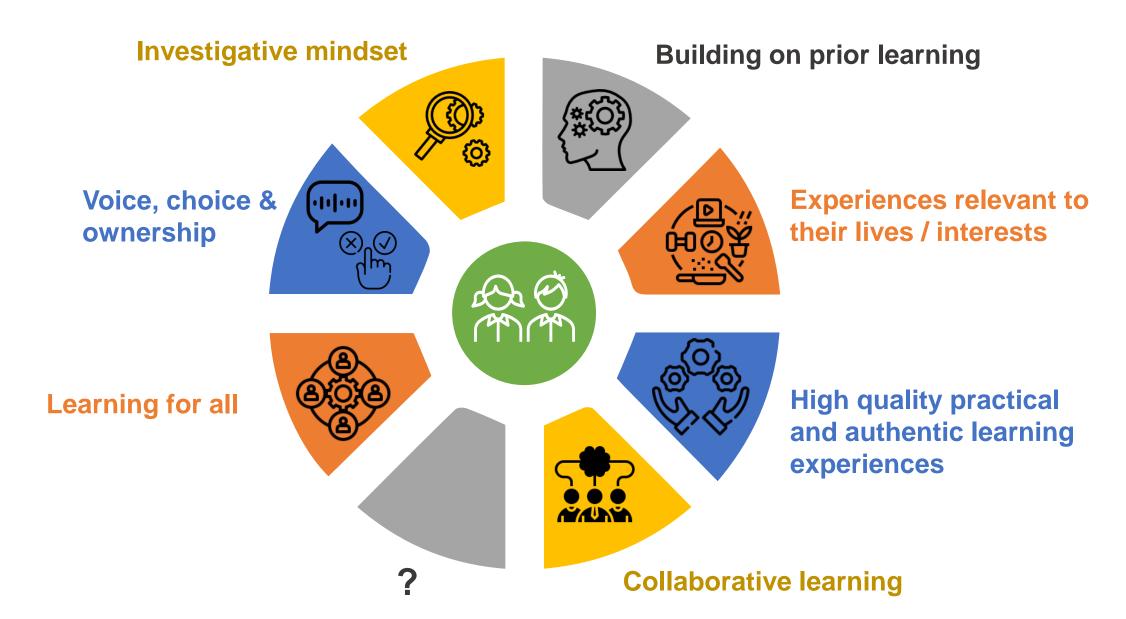
Teachers **collectively agree** and implement whole-school approaches to learning and teaching that include the use of online platforms and other digital technologies to improve students' experiences and outcomes.



What does a **student-centred approach** look like to you in the design of learning experiences?

Students at the Centre of Learning





Student-Centred Learning: The teacher perspective...





Andrew and Sarah, St. Oliver's Community College



St. Oliver's Community College, Drogheda





Student-Centred Learning



Context:

- First Year Classes
- Focus:

Student choice and ownership
Introduction to design and manufacturing skills



Andrew and Sarah, St. Oliver's Community College



Student-Centred Learning





Pg. 5



How is a student-centred approach evident in the design of learning experiences?

How is a **student-centred approach** evident in the design of these learning experiences?

Group Feedback & Discussion





How is a **student-centred approach** evident in the design of these learning experiences?



What does a **student-centred approach** look like in the design of learning experiences for your students?

Individual Planning Activity











Instruction:

Using your A3 activity sheet, consider the prompts below



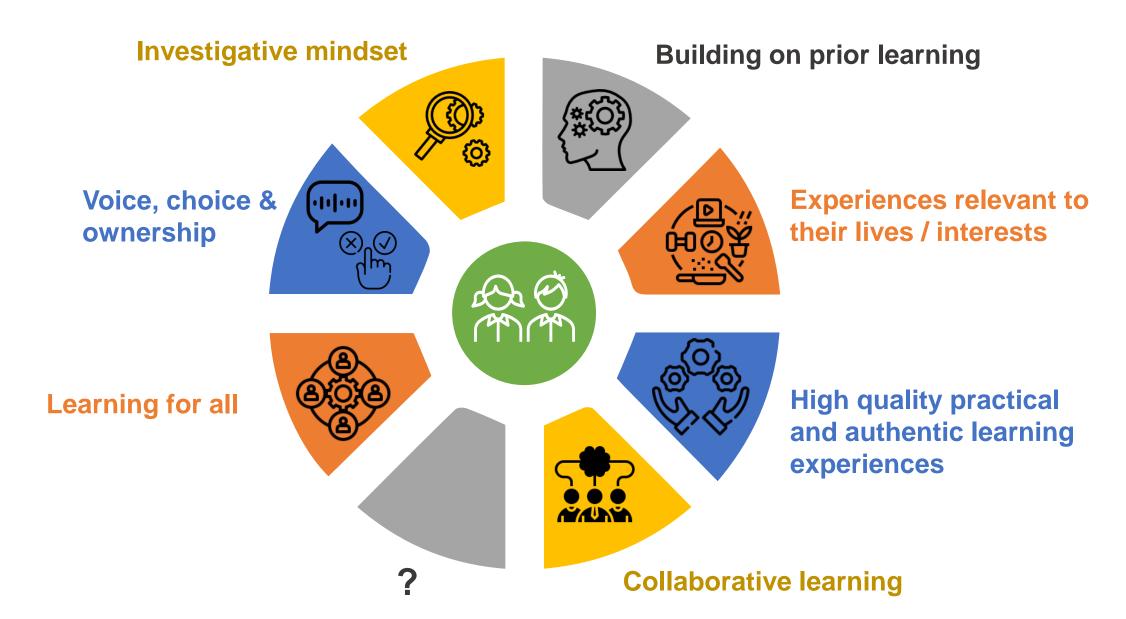
Consider an existing project/task for your students.

How is this project/task student-centred?

How could a student-centred approach be further developed?

Students at the Centre of Learning







Looking at Our School 2022





The teacher selects and uses planning, preparation and assessment practices Teachers' preparation identifies relevant learning intentions that are contextualised to students' learning needs, interests and abilities. Teachers' preparation identifies relevant learning intentions that are contextualised to students' learning needs, interests and abilities. Learning intentions reflect a developmental and

A P(Inspec Augus Teachers' preparation identifies relevant learning intentions that are contextualised to students' learning needs, interests and abilities. Teachers' preparation identifies relevant learning intentions that are contextualised to students' learning needs, interests and abilities. Learning intentions reflect a developmental and incremental approach to progressing students' learning.



Teachers identify and prepare in advance resources, including digital resources, where relevant, suitable for the specific learning intentions of each lesson, or series of lessons, and the learning needs of the class.

Teachers' preparation is informed by their knowledge of the curriculum and knowledge of pedagogy. It includes preparation for the differentiation of learning intentions and learning activities, and is informed by meaningful analysis of and use of data as well as teachers' professional judgement and decision-making.

Teachers identify and thoroughly prepare in advance resources, including digital resources, where relevant, tailored to match the specific learning intentions of each lesson, or series of lessons, and individual students' learning needs, interests and abilities.

Teachers' preparation is informed by their knowledge of the curriculum and knowledge of pedagogy. It includes preparation for the differentiation of learning intentions and learning activities, including personalised learning opportunities, and is informed by meaningful analysis of and use of data as well as teachers' professional judgement and decision-making.



In this session, we ...



Considered how our **practice is evolving** in the implementation of the Applied Technology specification



Explored what a **student-centred approach** looks like in the design of learning experiences

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE 2023/2024

Session 2





Themes for Today



Evolving Practice



Focus on Learning



In this session, we will...



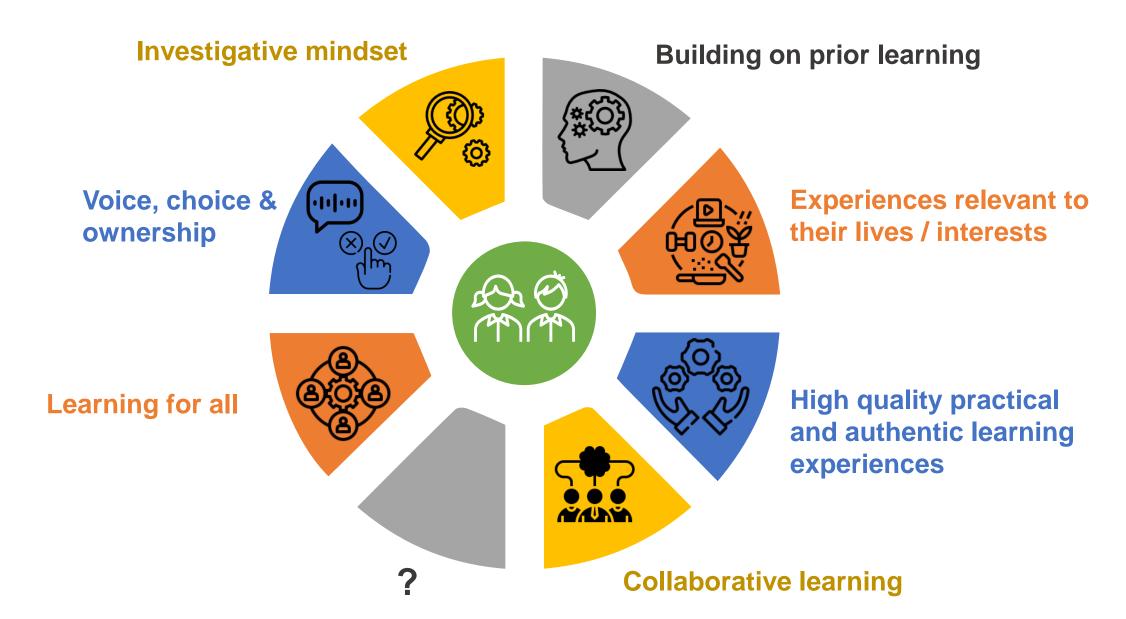
Explore what a student-centred approach looks like in the design of learning experiences



Design student-centred learning experiences and consider the needs of students in your context

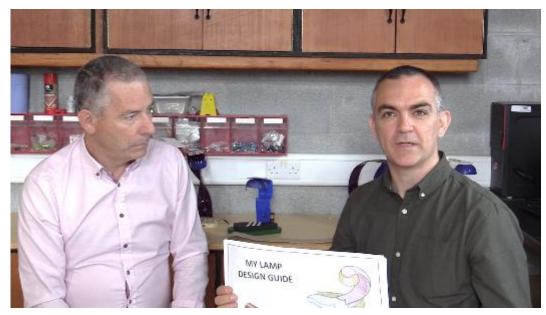
Students at the Centre of Learning





Let's consider the approach of an Applied Technology Department





Tom and James, Villiers School



Villiers School, Limerick





Villier's School



Context

- 600 students approx. in the school
- Two-teacher Applied Technology Department
- First year group
- Focus:

Development of design thinking skills Student choice and ownership

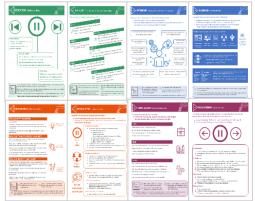


Tom and James, Villiers School

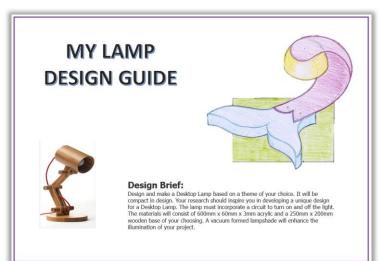


Supporting Students engaging in Design







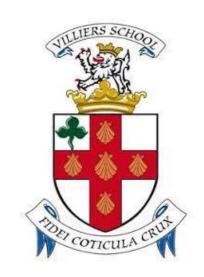






Oide

Villiers School, Limerick



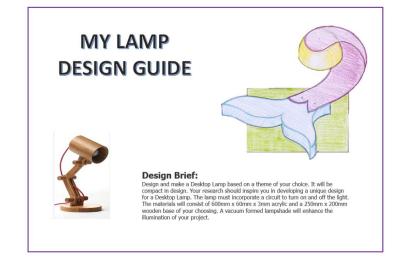


Student-Centred Learning



Villiers School, Limerick





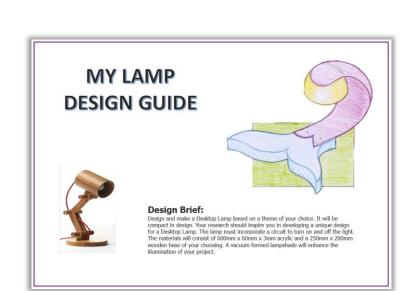
What is My Lamp Design Guide Resource?





How does 'My Lamp Design Guide' support student-centred learning?

Evolving Teaching and Learning



Student design journey

Instruction:

- Using your digital device, open 'My Lamp Design Guide'.
- 2. In pairs, consider the question below.







Pg. 6

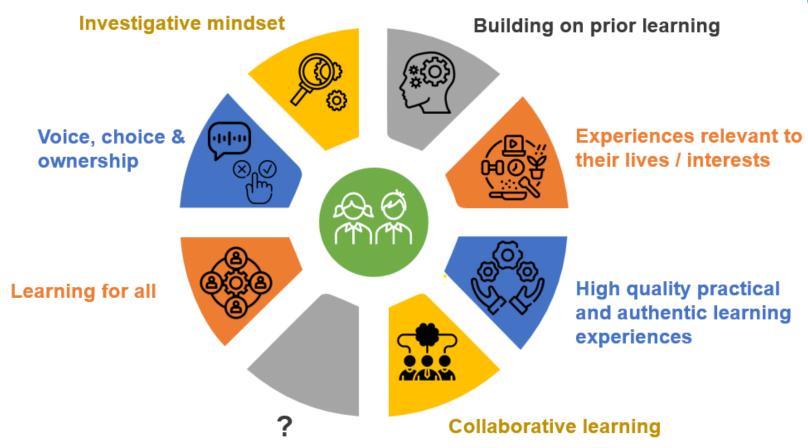


https://tinyurl.com/ techple2324

How does 'My Lamp Design Guide' support student-centred learning?



Reminder: Student-Centred Learning



How does 'My Lamp Design Guide' support student-centred learning?



Group Feedback & Discussion



How does 'My Lamp Design Guide' support student-centred learning? What other strategies could you use to support student learning?





Let's collaborate to generate practical learning experiences that activate key learning

Applied Technology – Learning Outcomes

Strand 1: Principles and practices Strand 2: Energy and control In this strand, students will learn about and employ the fundamental principles and

Strand 3: Technology and society







Action Verbs:

Analyse: study or examine something in detail, break down in order to bring out the essential elements or structure; identify parts and relationships, and to interpret information to reach conclusions

Apply: select and use information and/or knowledge and understanding to explain a given situation or real circumstances

Communicate: use visual gestural, verbal or other signs to share meaning or exchange information; interaction between sender and recipient; both work together to understand

Consider: think carefully about something, typically before making a decision

Create: process and give form to the topic of what is to be created using selected methods and material and/or to give the material used a new form

Demonstrate: prove or make clear by reasoning or evidence, illustrating with examples or practical application

Design: planning the features of a solution that solves a perceived user problem

Develop: advance a piece of work or an idea from an initial state to a more advanced state

Discuss: offer a considered, balanced review that includes a range of arguments, factors or hypotheses; opinions or conclusions are supported by appropriate evidence

Document: a piece of written, printed, or electronic matter that provides information or

Execute: to carry out fully, to put completely into effect



Student Context:



Tacú leis an bhFoghlaim
Ghairmiúil i measc Ceannairí
Scoile agus Múinteoirí
Scoile agus Múinteoirí
Scoile agus Múinteoirí

Communicate a practical learning experience to activate key learning:





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Focus of Learning:

Chosen Learning Outcomes:

Key Learning: Using action verbs to support your thinking.

What resources would be needed?

How could the key learning be assessed?











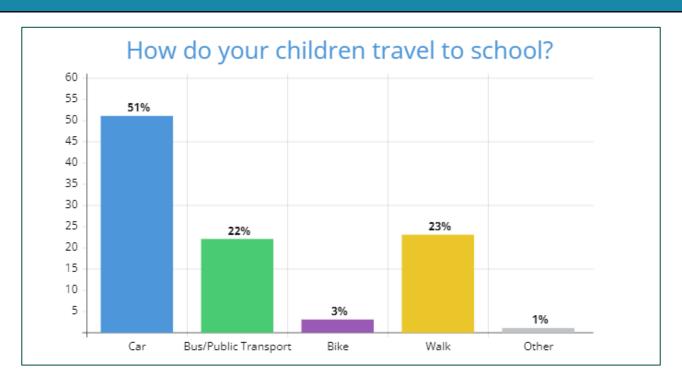






Theme to Focus Learning:

Travelling to school



Source: Amárach Research Panel, August 2023



Cordarragh Community School

Context:

- Rural co-educational school 700 students
- 1st Year Applied Technology 22 students

Theme:

Travelling to school







Cordarragh Community School





Prior Learning

- Students have completed two projects with supplementary research tasks
- Introduction to manufacturing skills marking out, drilling, shaping, assembly
- Investigated applications of technology in a real-world context
- Communicated learning- sketching, completion of a short learning log



Oide

Introduction to control systems and advancing practical skills

Chosen Learning Outcomes

- 2.3 **recognise** the principles of control systems when developing their solution
- 1.2 **analyse** problems using a systematic approach
- 1.10 **execute** a plan using appropriate tools, materials and processes
- 3.8 **evaluate** the impact of technologies on their lives, society and the environment

Key Learning

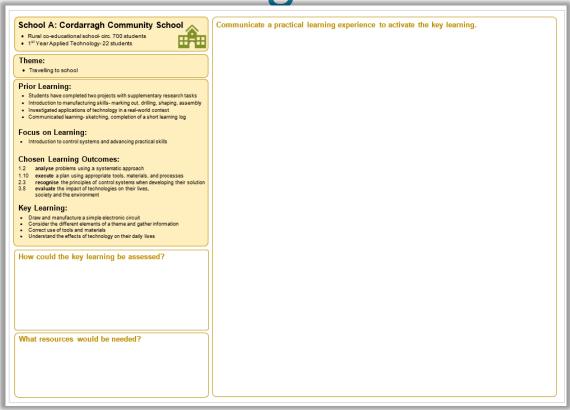
- Draw and manufacture a simple electronic circuit
- Consider the different elements of a theme and gather information
- Correct use of tools and materials
- Understand the effects of technology on their daily lives

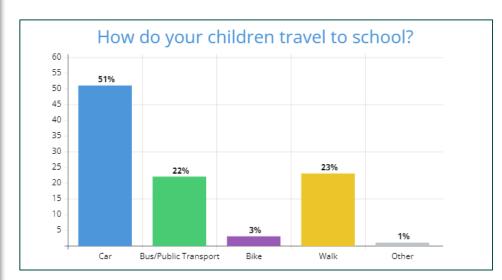


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Communication use visual gestural, verbal or other signs to share meaning or exchange information, interaction between sender and recipient, both work together to		technologies which will help coalents to decide the best means to createdly other a real world problem and realise a solution. Standards should be able to:	makes will create controlled infollows using the state, beautistics, values and at this his decomposi- tionings the state of the other streets.	Southern should be able to:	in order to find out more about it. Evaluate: [ethical judgement] collect and examine evidence to make judgements.
indentiand amplifer this conflutly about comething, growth before making a decision ceases process and give forms to the copy of what is to be created using selected methods and standard and/or to give the meterial used a new form.	Analysis and problem solving	1.1 develop a design solution freeing on experience and sing devidence, reasoning, and decision making. 1.2 analyse profilmes using a systematic approach 1.3 million ideas through the use of prototyping 1.4 newew planning decisions throughout.	2.1 investigate relationships between the impute, transferred tens, and outputs occurring within simple control authors	3.1 enalyse the impact of consmitts on the design of solutions 3.2 evaluate the effectiveness of solutions	and agentasis, describe from enimete supports or dess not support or judgement; identify the limitations of entiment in conclusions, make judgement about the ideas, solutions or methods lidentify; recognise patterns, facts, or detail; provide on sorower from a existing of journitificies, recognise and case breefly
Nemocrateis prove or make clear by seconing or evidence, illustrating with semigles or practical application beigns planning the features of a solution has solve a perceived user problem herebyes otherica a piece of note or an deed from an ordinal state to a more property of the property of the pro-	Design and Innovation	1.5 consider the end-user experience at each plage of the design process. 1.6 understand the role, inquot and potential of existing and emerging technologies. 2.7 apply innocation approaches in design potenties.	systems when developing their solution 2.4 design a logical sequence of instructions to control a device or system	3.3 explain how human, societal and environmental considerations effect societions and estimate. 3.4 explores applications of technology in local contacts.	a distinguishing fact or feature. Investigates observe, study, or make a detailed and systematic examination, to exhabitish facts and neach new conclusions. Auditing give valid respons or evidence to appoint an anower or conclusion.
infranced state Nonsec offer a cresidened, balanced notes that includes a range of arguments, colors or hipportness; spenies or conclusions are supported by appropriate notificate becomests a piece of suittees, primed, or inclusions; wanter that provides information a conference water that provides information or suitfaces.	Plunning, moneging, and creating	1.8 decedap a plan for the realization of a polyston. 1.9 select appropriate melectral, equipment and processes in authorists, a problems. 1.10 execute a plan sping appropriate trail, estabelists and processes. 1.11 demonstrates and annexes to recognised health and sufery standards.	2.6 explare onergy conservation and efficiency. 2.7 identify appropriate energy and control options for design solutions 2.6 oreans correl solutions to identified problems	3.5 pastify their selection of evalurials and processor based on factors such as environmental, economic and efficial considerations. 2.6 considerations that the selection of design 1.7 recognises their responsibility for ensysting security and privacy of personal data.	Recognize identify facts, chemicar-intics of cascapts that are ortical (relevant) aggregating to the understanding of a situation, event, protest or phenoceasion. Refine male, where cheepes so as to improve or dentify. Reviews tooking over or through management in order to correct, improve or revise.
revidence secute: to carry out fully, to put corpletely into effect	Communicating	1.12 desawers progressors from concept to realization 1.13 communicate evidence of the iterative process of design	2.5 communicate technical information in appropriate forms 2.10 explain the transformation of inputs and outputs	3.5 evaluate the impact of technologies on their lives, society and the environment 3.5 disconnitive potential of technology to affect society and the environment	Select: carefully choose as being the best or most suitable based on sulgement Understands have and apply a self- organised beds of knowledge



Enacting the Learning











Using your A3 activity sheet, communicate a practical learning experience that allows students to experience the key learning identified

Communicating your Project Idea









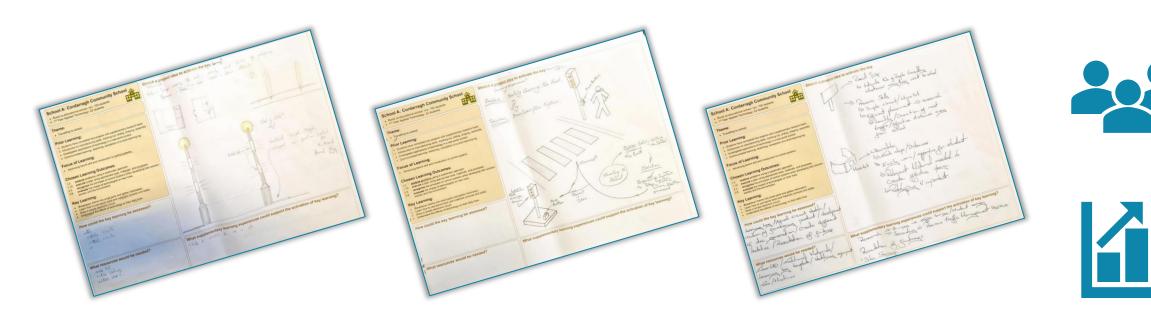


- Communicate a practical learning experience
- Assessment opportunities
- Resources



Jigsaw - Carousel Activity





Consider alternative practical learning experiences through a "*Jigsaw*" activity



Jigsaw- Carousel Activity



Instructions:

1. Allocate a number to each teacher at your table, starting with number 1, number 2, etc.



2. All the no.1 teachers should come together, no.2 teachers come together, etc.

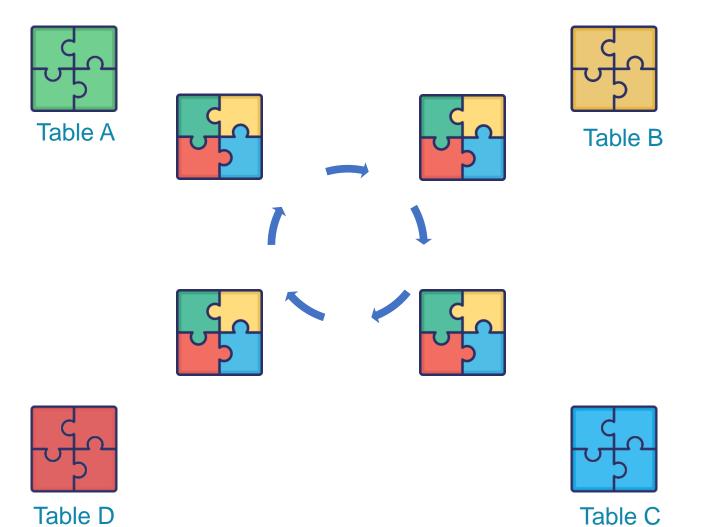


- 3. No.1s go to table A, no.2s go to table B, etc.
- 4. The person from your group who developed the learning experience at your table will share the idea with your group.
- 5. After 5 minutes, every group moves to the next table (clockwise direction) and repeat step 4.



Jigsaw - Carousel Activity











Personal Reflection Moment





Choose one project idea that may appeal to your students.

How could this project idea meet the needs of students in your context?



Pg. 7

What other Learning Outcomes/key learning could your students activate through this project idea?



Personal Reflection Moment



Factors to consider:

- Prior knowledge of your students
- Learning Outcomes/key learning intended
- Strategies
- Resources
- Assessment





In this session, we ...



Explored what a student-centred approach looks like in the design of learning experiences



Designed student-centred learning experiences and considered the needs of students in your context

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE 2023/2024

Session 3





Themes for Today



Evolving Practice



Focus on Learning



In this session, we will...



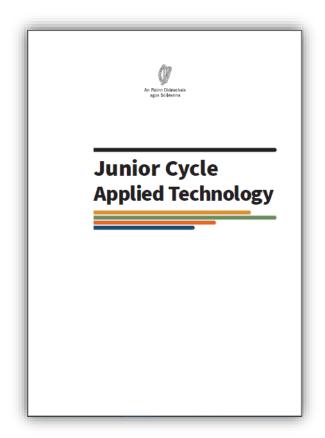
Explore how numerical understanding in mechanical control can be enhanced through practical experiences



Consider opportunities to support students in advancing an idea from a prototype to a final solution



Applied Technology Specification



The study of Applied Technology at junior cycle aims to:

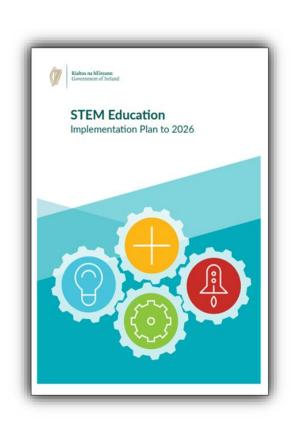
 enable students to develop the necessary conceptual understanding, disciplinary skills and subject knowledge to investigate and solve real-life problems

NCCA, Applied Technology specification, page 5.

www.curriculumonline.ie

STEM Education Implementation Plan to 2026





The Policy Statement vision for STEM education is that:

Ireland will be internationally recognised as providing the highest quality STEM education experience for learners that nurtures curiosity, inquiry, problem-solving, creativity, ethical behaviour, confidence, and persistence, along with the excitement of collaborative innovation.

STEM Education Implementation Plan to 2026, page 4



SEC Information Note



Coimisiún na Scrúduithe Stáit State Examinations Commission

Junior Cycle Examinations 2022

Information note on Junior Cycle examinations in a range of subjects

March 2023



"Teachers should support candidates in recognising, understanding, and using common mechanisms appropriately."

SEC, Information note on Junior Cycle examinations in a range of subjects, page 39.





Personal Reflection Moment

How do you support students to develop a better understanding of mechanism calculations?







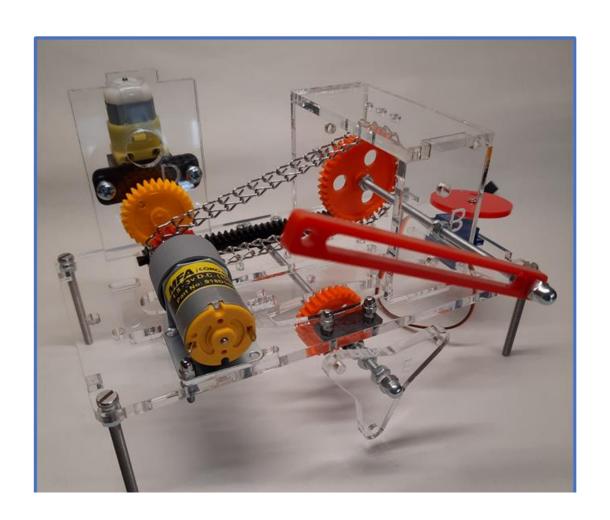
Through a practical learning experience, let's explore how students can develop a better understanding of mechanism calculations



Control Prototype Resource

Pair work Activity:

Take out your resource and components



Teacher Activity 1: Set up a simple gear train mechanism







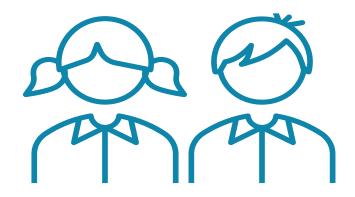
- 1. Using M4 x 50 screws and nuts, assemble the legs
- 2. Using M4 x 30 screw, nut and washer, assemble 40T gear to the base
- 3. Using M4 x 30 screw, nut and washer, attach the 20T gear to the slot of the base
- 4. Adjust the position of 20T gear so that both gears are meshed together

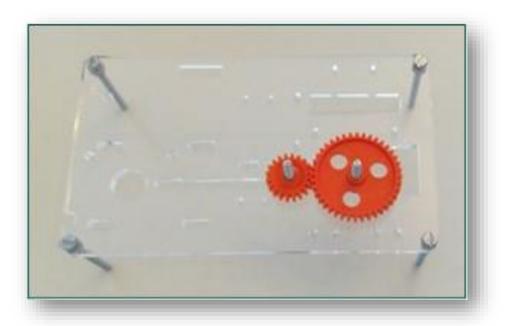






Teacher Activity 1:













Pg. 8

How can students learn about gear ratios in a practical way?







Identify and Explain

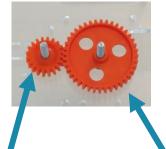
Key Terms

- Gear
- Meshing pair
- Driver
- Driven
- Teeth
- Rotation relationships
- Gear ratio

- Torque
- Mechanical advantage
- RPM



Investigate and Record



Driver

Driven

Compose your own mathematical sentence(s) to describe the relationship(s) between the Driver and the Driven gear

	Teeth on Driven Gear	Teeth on Driver Gear	Gear Ratio
6.00			

Rotations of Driver Gear	Rotations of Driven Gear	Gear Ratio

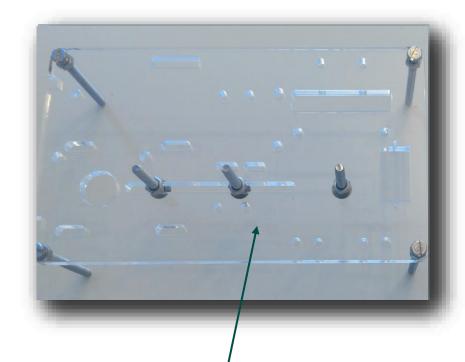
Gear Ratio = $\frac{\text{teeth of driven gear}}{\text{teeth of driver gear}} = \frac{\text{rotations of driver gear}}{\text{rotations of driven gear}}$



Teacher Activity 2: Add an idler gear to the gear train mechanism







Idler gear

- Adjust the position of the 40T and 20T gear
- Select an additional gear and position it between the 40T and 20T gear
- 3. Adjust the position of 40T and 20T gear so that both gears are meshed with the new idler gear



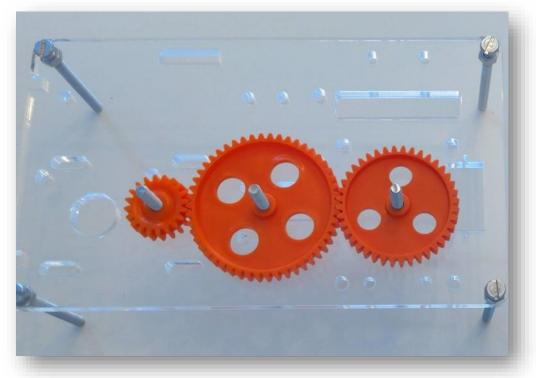




Teacher Activity 2:













Pg. 10

What impact does the idler gear have on the driven gear?







Identify and Explain

Idler gear

- Is placed between the driver gear and the driven gear
- Is used to change the direction of the driven gear
- Is used to fill a large gap between the driver and driven gear
- Can be any size
- Has NO effect on the gear ratio
- Has NO effect the output speed



Group Feedback & Discussion



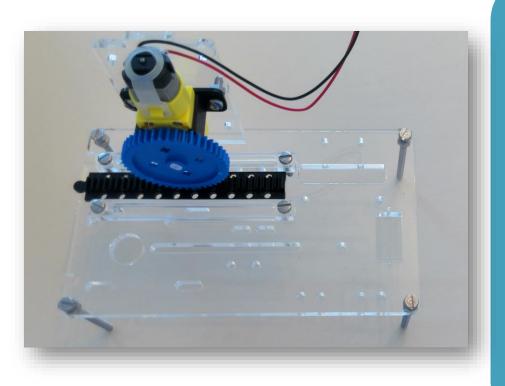


How has the practical experience supported you in developing a better understanding of the operation of a simple gear train?

Teacher Activity 3: Set up a rack and pinion system







- 1. Click DC Motor and attachment into the base
- 2. Using M4 screws and nuts, assemble the 2 guides for the rack to the base
- 3. Place the rack between the guides and attach blue 40T pinion to the motor



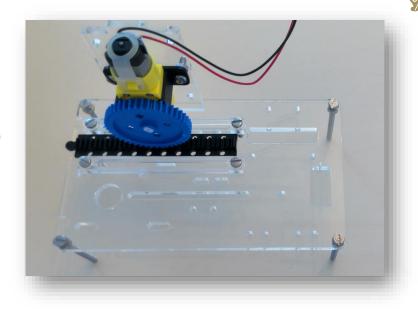




Teacher Activity 3:

Multiple ways to better understand the relationship between a rack and pinion













Explore how students could learn about the distance a rack travels when driven by a pinion

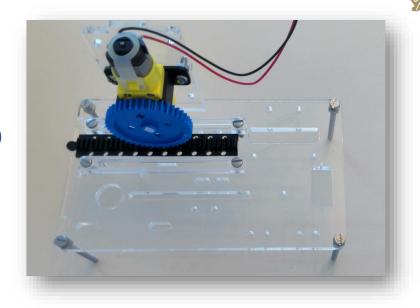


Pg. 11

Teacher Activity 3:

Multiple ways to better understand the relationship between a rack and pinion













For a quarter turn of the pinion, estimate how far the rack travels



Pg. 11



Group Feedback & Discussion



How can students learn about the distance a rack travels when driven by a pinion?





Oide

Personal Reflection Moment

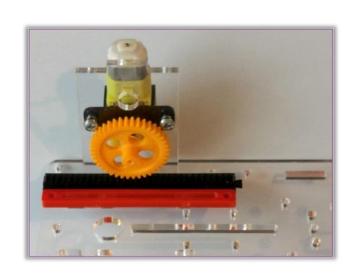
How can we support students to develop a better understanding of mechanism calculations?



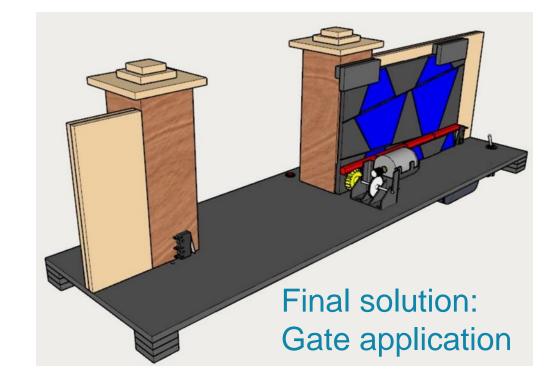


Moving Forward...

Let's explore how an idea can advance from a prototype to a final solution











Personal Reflection Moment

How can we support students in advancing a mechanical control idea from a prototype to a final solution?

Advancing an Idea from a Prototype to a Final Solution





Colman, St. Gerald's DLS College, Castlebar



St. Gerald's DLS College, Castlebar





St. Gerald's DLS College

Context:

Second Year group

Focus:

Students investigating the requirements for a rack and pinion system to solve a problem



Colman, St. Gerald's DLS College, Castlebar



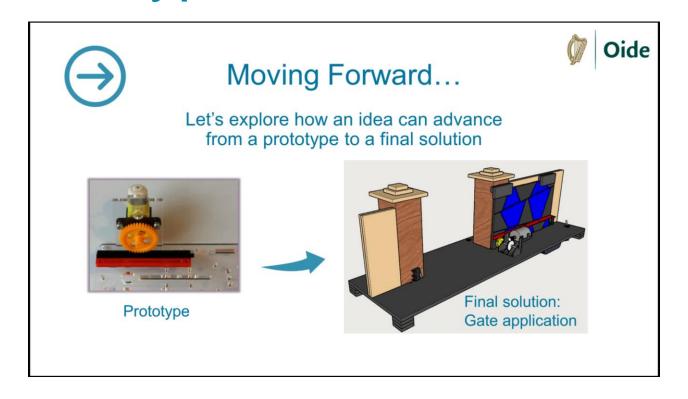
Advancing an Idea from a Prototype to a Final Solution







Pg. 12



What strategies can support students in advancing an idea from a prototype to a final solution?



Group Feedback & Discussion



What strategies can support students in advancing an idea from a prototype to a final solution?



In this session, we...



Explored how **numerical understanding** in mechanical control can be enhanced through practical experiences



Considered opportunities to support students in advancing an idea from a prototype to a final solution



Themes for Today



Evolving Practice



Focus on Learning

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE Day 2023 - 2024

Thank you for your participation in today's session

