Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE 2023/2024

CC BY NC

Meet the Team - Applied Technology

Oide

Seán Kehoe
Professional Learning Leader

Fergal Murphy
Professional Learning Leader

Barry Nolan
Senior Leader

Partners

An Roinn Oideachais
Department of Education

www.education.ie

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

www.ncca.ie

Coimisiún na Scrúduithe Stáit
State Examinations Commission

www.examinations.ie

Oide

www.oide.ie

Key Website / Online information

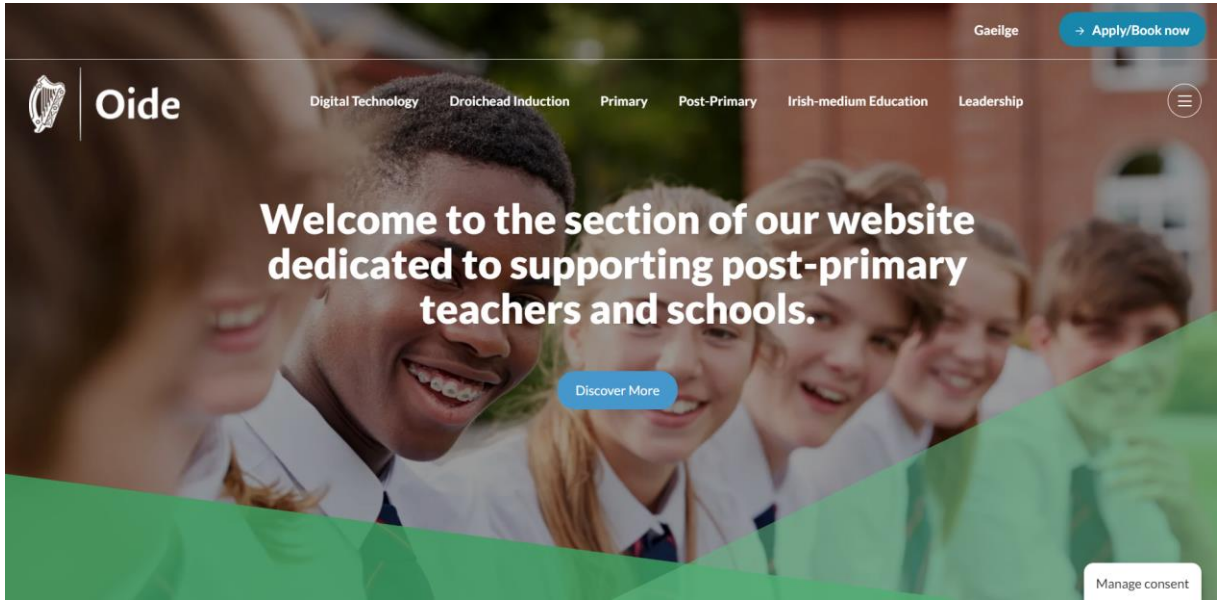
www.curriculumonline.ie

www.ncca.ie

www.oide.ie

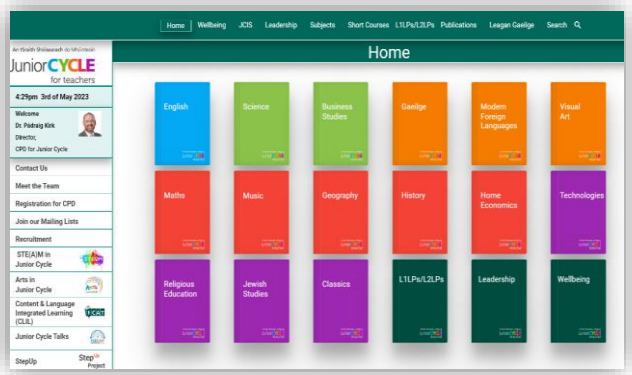
𝕏 @Oide_PP_Tech4

E: info@oide.ie



Oide Mailing List

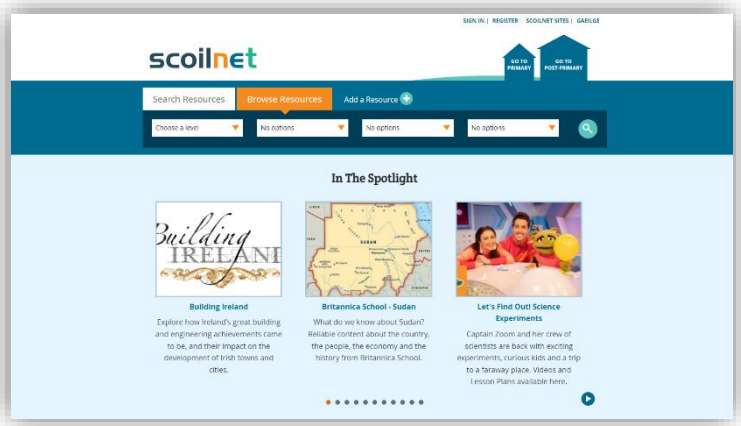
Resources



www.jct.ie

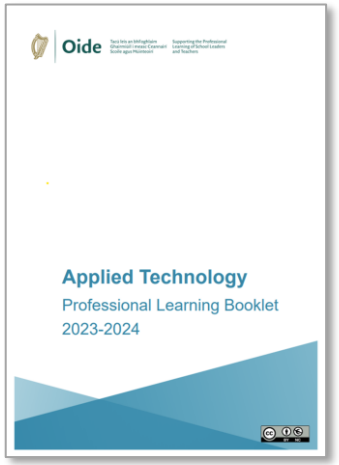
www.oide.ie

www.t4.ie



www.scoilnet.ie

PLE Supports



Professional Learning Booklet

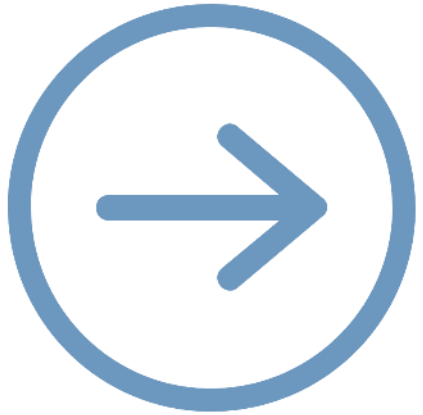
Activities and Group Discussion

Practical Learning Experiences

Teacher Testimonials

Pause and Reflect ….

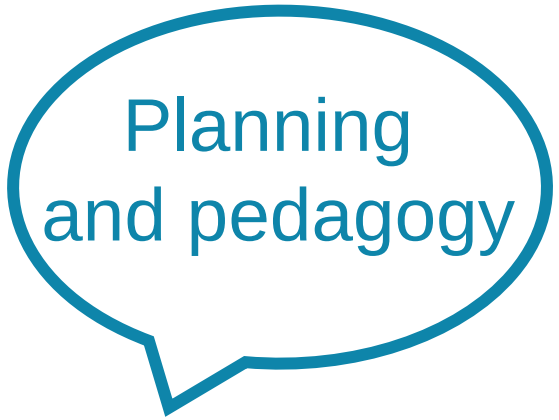
Reflecting on Feedback..



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

What is new in Applied Technology?

PLE 2022/2023 – Feedback



Themes for Today

Evolving Practice

Focus on Learning

Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE 2023/2024

Session 1

CC BY NC

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

Ice Breaker Activity

10 minutes

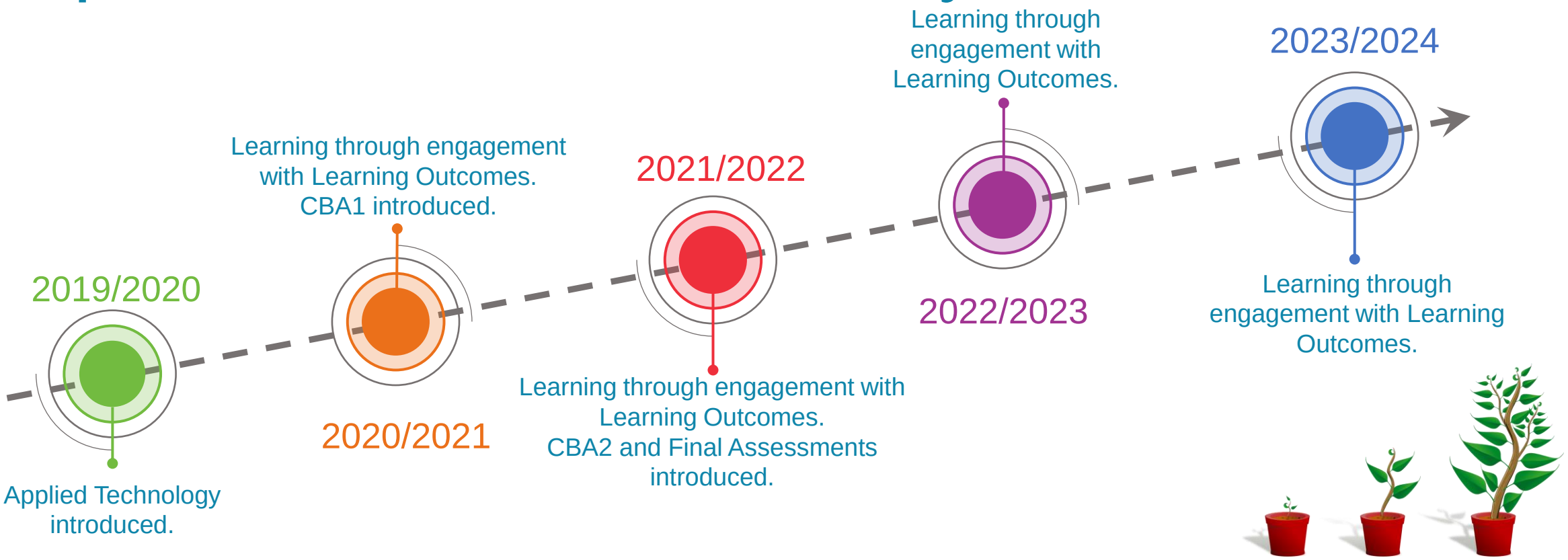
Pg. 2

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

Open Floor Discussion

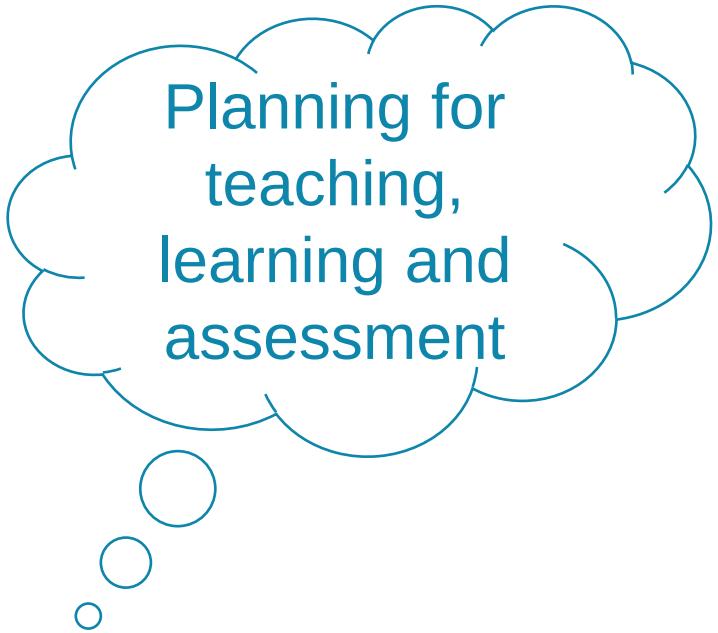
Share **one positive learning experience** that your students had in Applied Technology this year

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

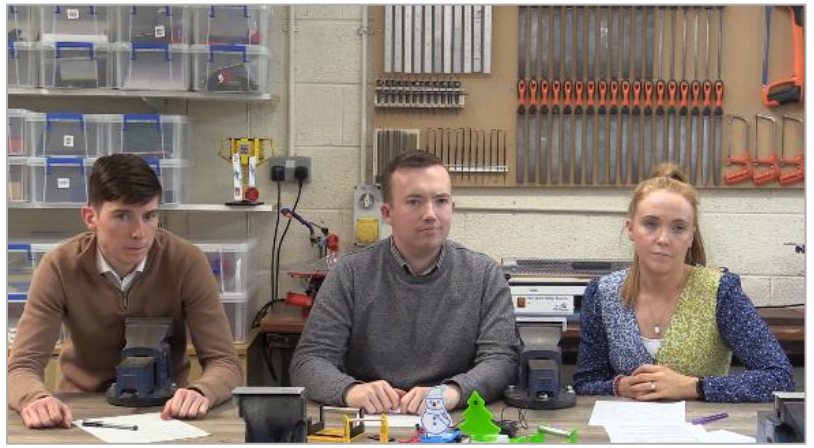
Mike, Andrew and Sarah,
St. Oliver’s Community College

St. Oliver’s Community College, Drogheda

St. Oliver’s Community College

Context:

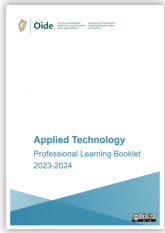
- 1400 students approx. in the school
- Large Applied Technology Department - 5 teachers
- New and experienced teachers



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

Evolving our Practice

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



Pg. 3

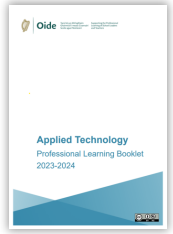
In implementing the subject specification,
how is your practice evolving to support student learning?

Group Feedback & Discussion

10 minutes

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

Evolving our Practice

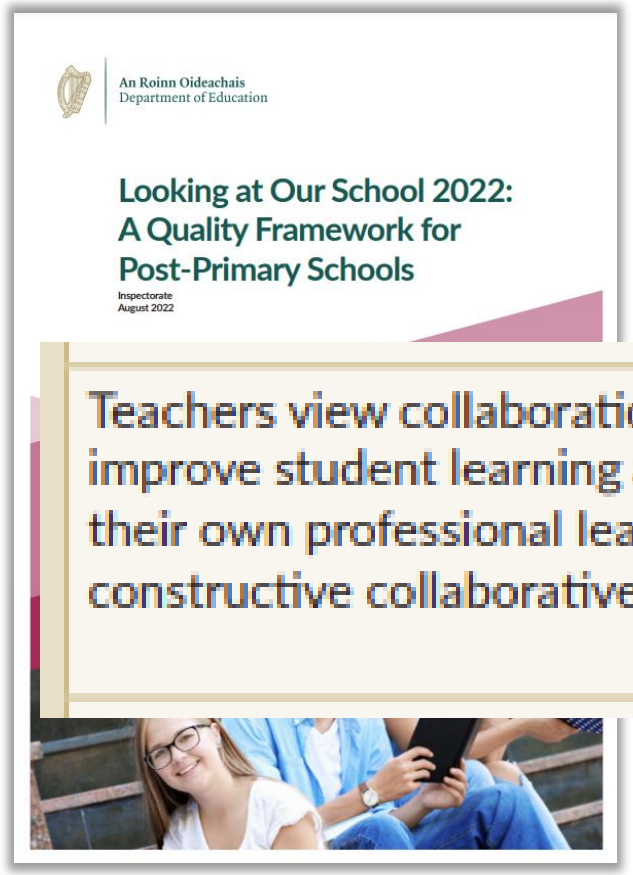


Pg. 4

5 minutes

- 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



L
D
pl
ative

Domain 4: Teachers' collective / collaborative practice

Standards	Statements of effective practice	Statements of highly effective practice
Teachers value and engage in professional learning and professional collaboration	Teachers recognise that professional learning and collaboration are intrinsic to their work.	Teachers recognise **and affirm** professional learning and collaboration as intrinsic to their work.
	Teachers use formal meetings and planning time to reflect together on their work.	Teachers use formal meeting and planning time to reflect together on their work.
	Teachers engage actively and productively with a variety of professional learning opportunities, including organised school-based professional	**The school is a key context in which teachers' professional learning occurs**. Teachers engage actively and productively with, **and devise**, a
	Teachers work to maintain 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 and take responsibility for their own wellbeing.	Teachers work **proactively** to maintain **and 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.

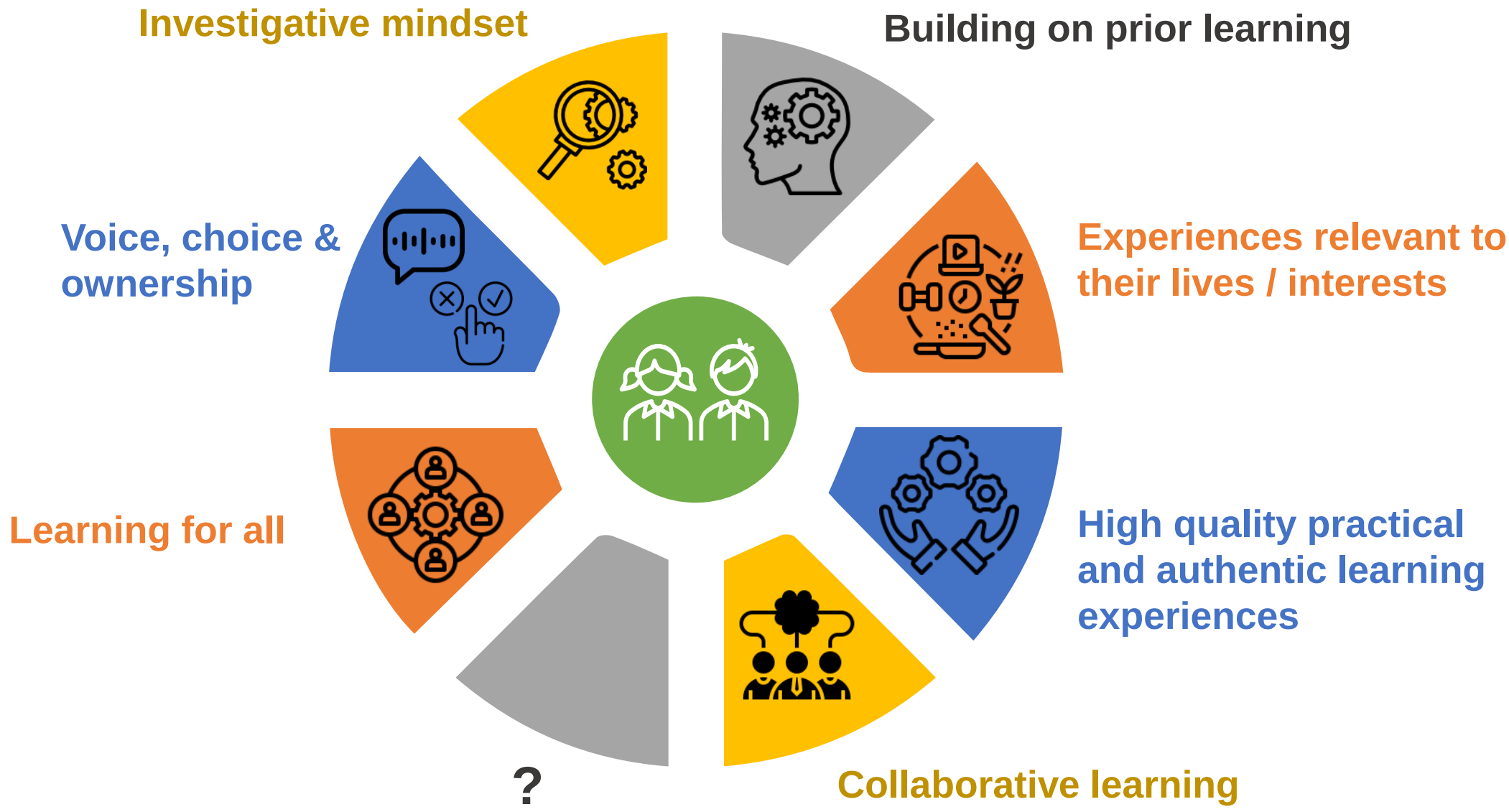
Teachers view collaboration as a means to improve student learning and also to enhance their own professional learning. They engage in constructive collaborative practice.

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.**

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

Students at the Centre of Learning

Oide



Student-Centred Learning:
The teacher perspective...

Andrew and Sarah,
St. Oliver's Community College

St. Oliver's Community College, Drogheda

Student-Centred Learning

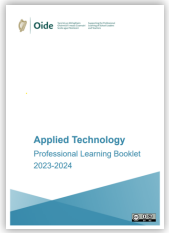
Andrew and Sarah,
St. Oliver's Community College

Context:

- First Year Classes
- Focus:
  - Student **choice and ownership**
  - Introduction to **design and manufacturing skills**

Student-Centred Learning

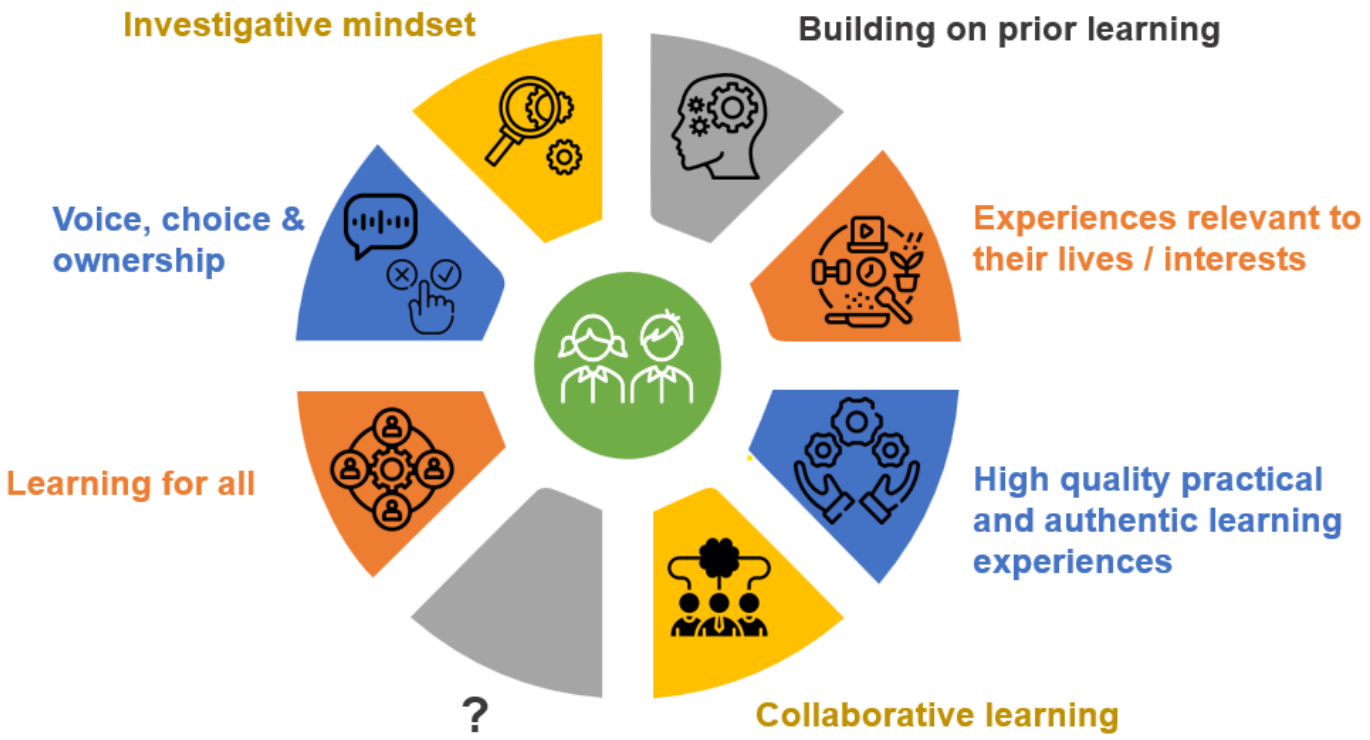
How is a student-centred approach evident in the design of learning experiences?



Pg. 5

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

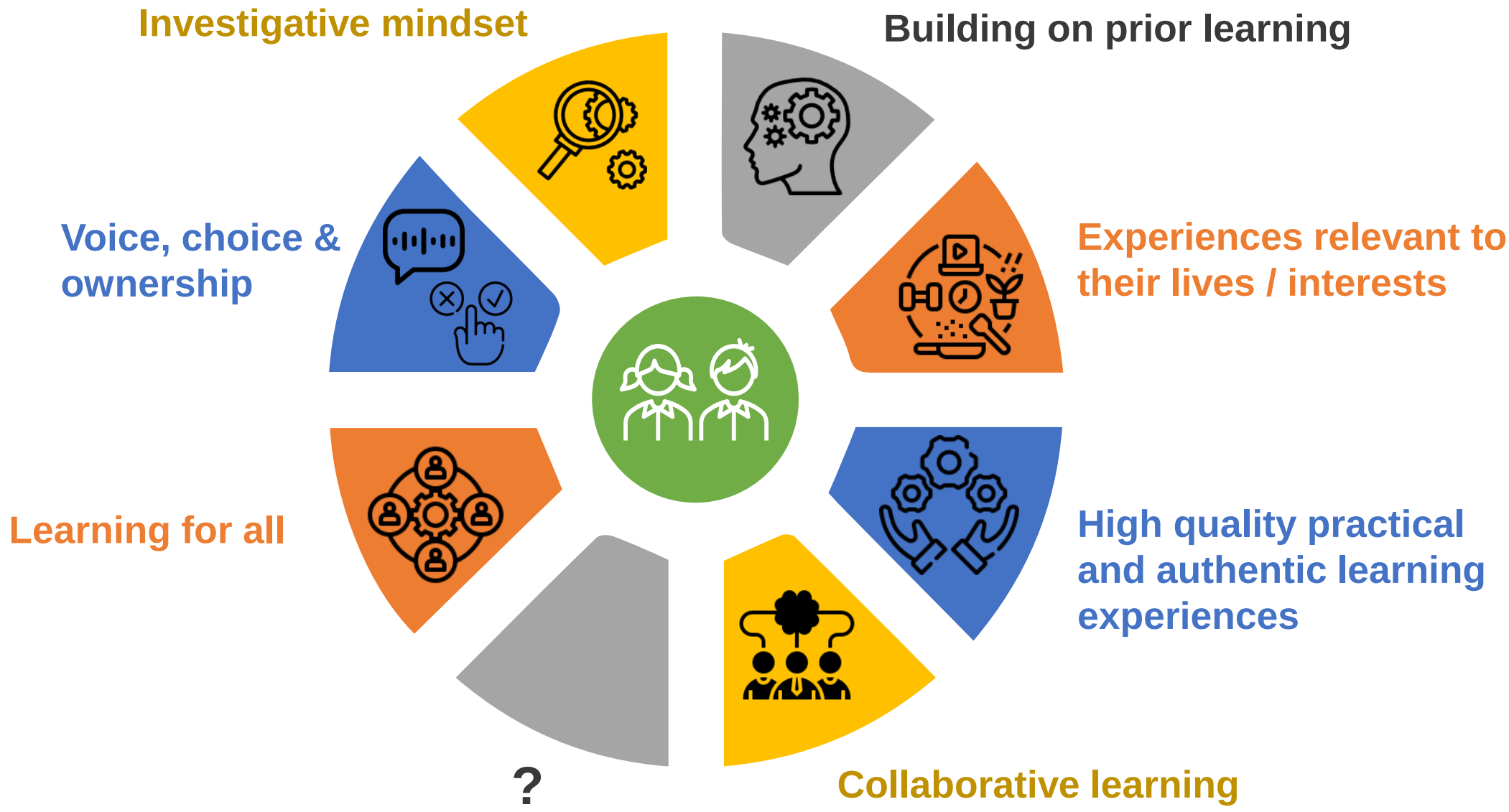
Instruction:

Using your **A3 activity sheet**, consider the prompts below

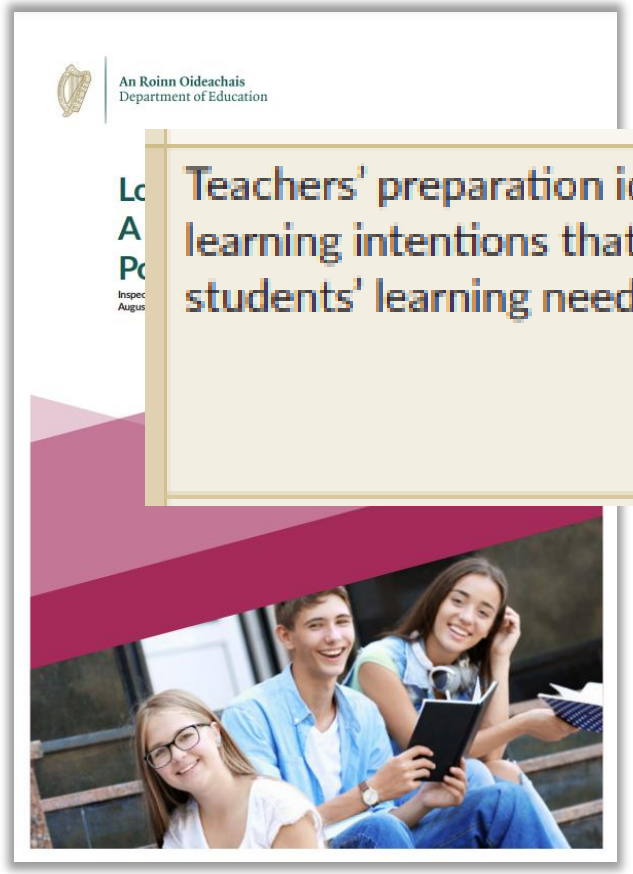
Consider an existing project/task for your students.
How is this project/task student-centred?
How could a student-centred approach be further developed?

Students at the Centre of Learning

Oide



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**
	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 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, and is informed by meaningful analysis of and use of data as well as teachers' professional judgement and decision-making.	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.

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.**

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

Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE 2023/2024

Session 2

CC BY NC

Themes for Today

Evolving Practice

Focus on Learning

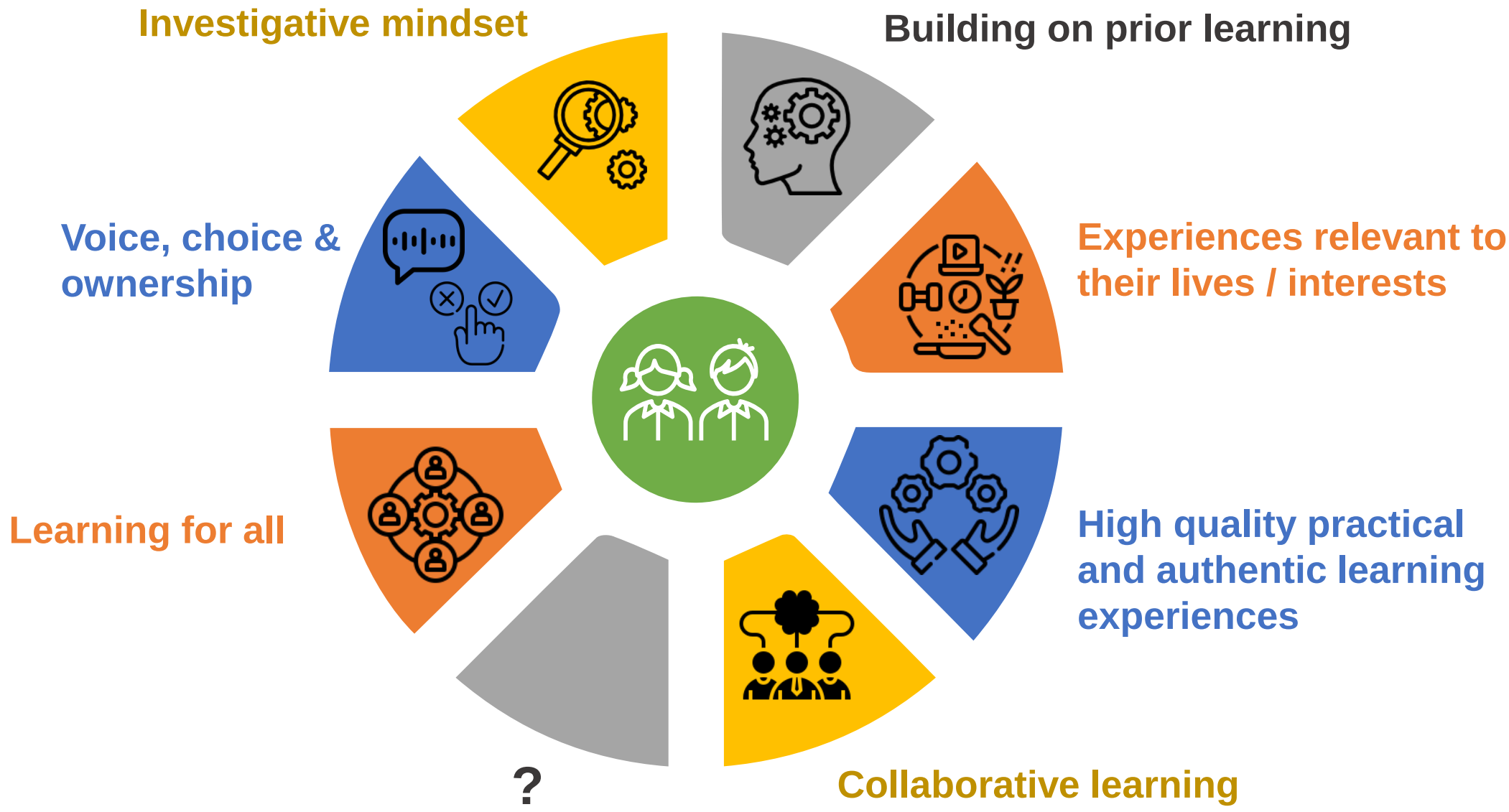
In this session, we will…

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

Oide



Let’s consider the approach of an Applied Technology Department

Tom and James, Villiers School

Villiers School, Limerick

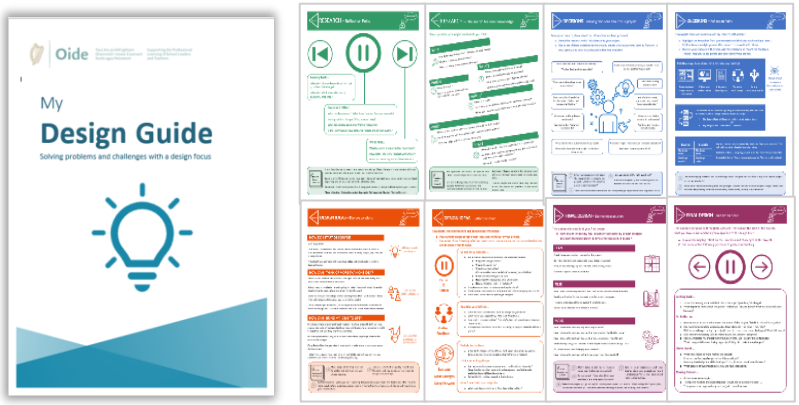
Villier's School

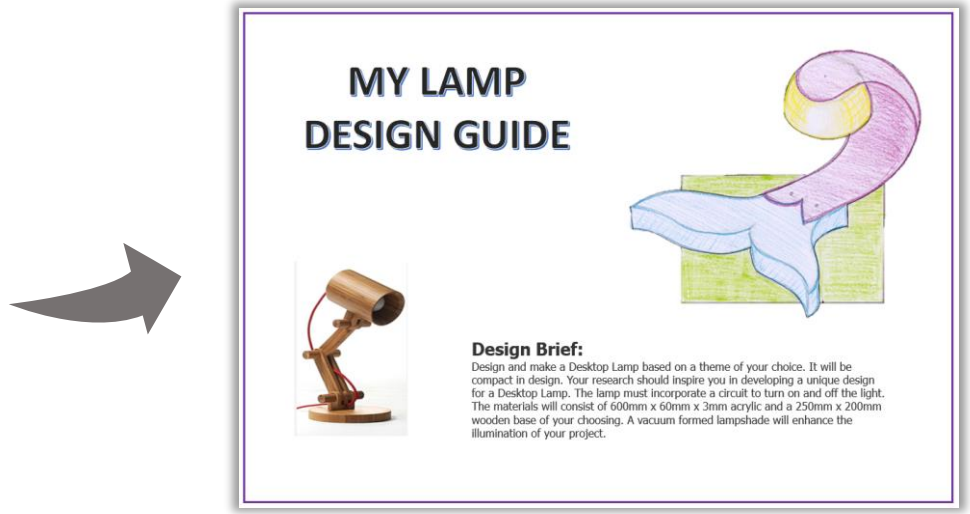
Tom and James, Villiers School

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

Supporting Students engaging in Design





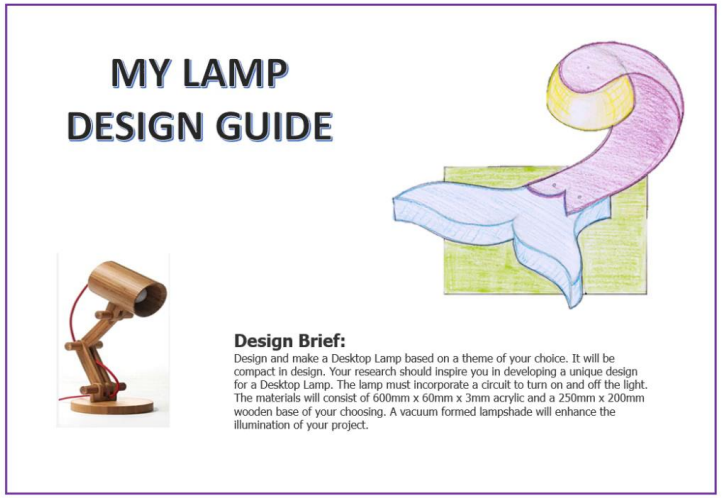
Adapting ‘My Design Guide’ resource

Villiers School, Limerick

VILLIERS SCHOOL
FIDEI COTICULA CRUX

Student-Centred Learning

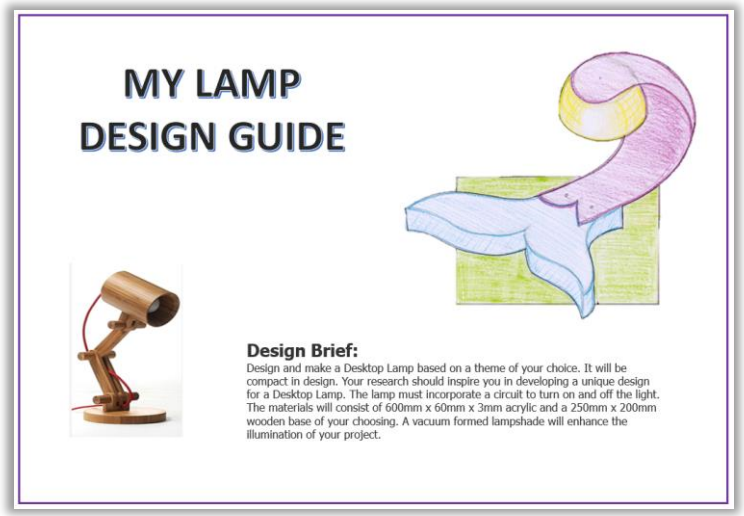
Villiers School, Limerick



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:

1. Using your digital device, open ‘My Lamp Design Guide’.
2. In pairs, consider the question below.

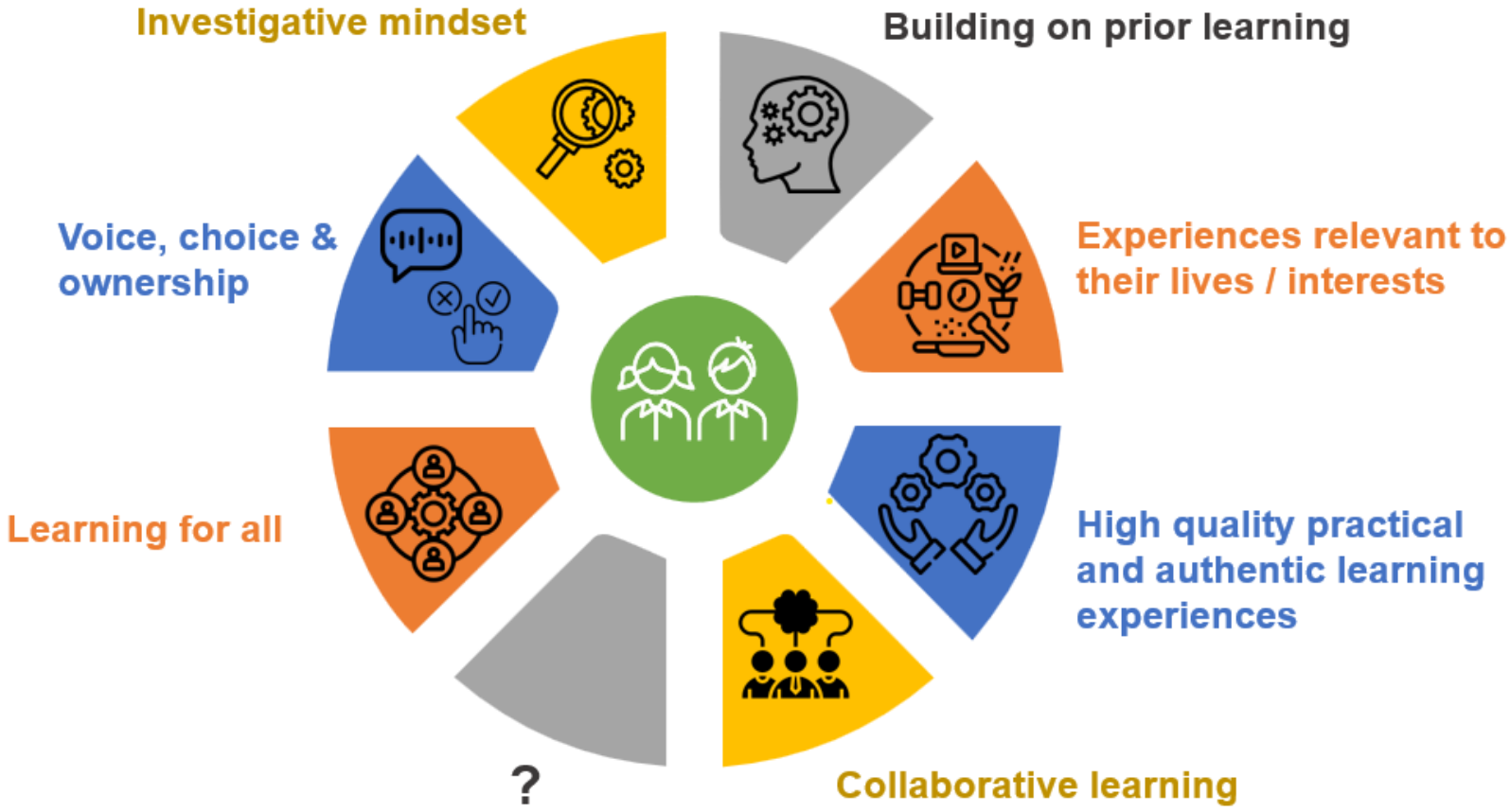
10 minutes

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

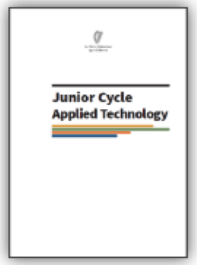
Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology – Learning Outcomes

Strand 1: Principles and practices	Strand 2: Energy and control	Strand 3: Technology and society
In this strand, students will learn about and employ the fundamental principles and	In this strand, students explore sources of energy which, when changed or controlled,	In this strand, students experience the interaction between 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 evidence

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

CC BY NC

Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Student Context:

Prior Learning:

Focus of Learning:

Chosen Learning Outcomes:

Key Learning:
Using action verbs to support your thinking.

Communicate a practical learning experience to activate key learning:

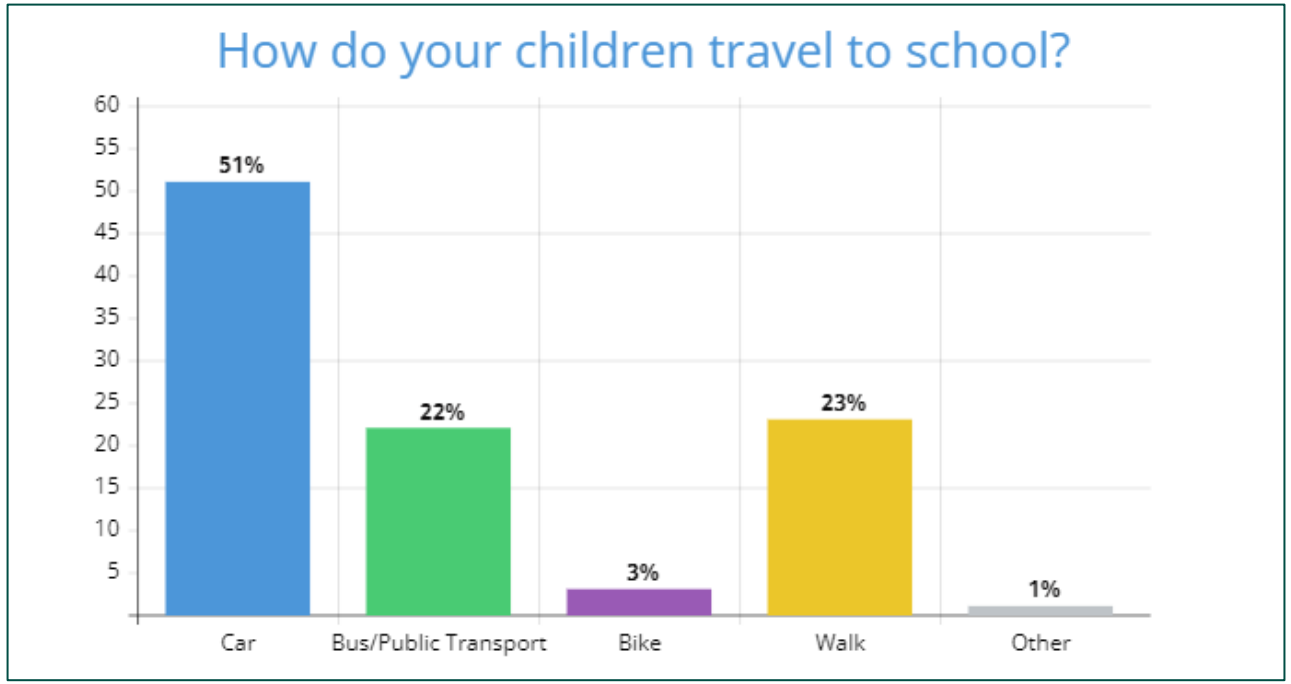
What resources would be needed?

How could the key learning be assessed?

CC BY NC

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

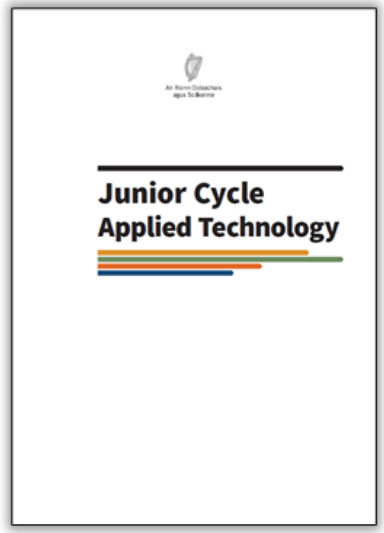
Cordarragh Community School

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

Focus of Learning

- Introduction to control systems and advancing practical skills



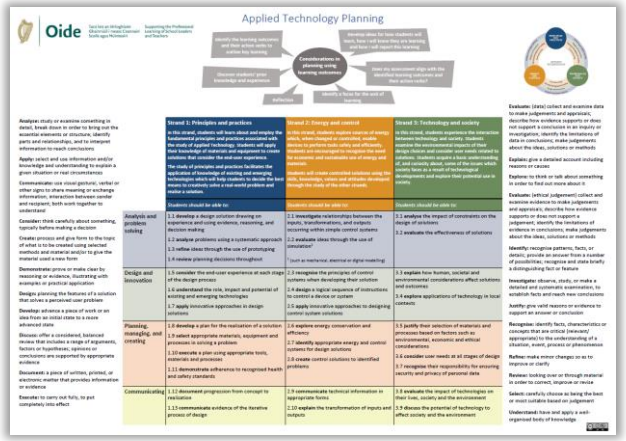
Chosen Learning Outcomes

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

Enacting the Learning

School A: Cordarragh Community School

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

Theme:

- Travelling to 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

Focus on Learning:

- Introduction to control systems and advancing practical skills

Chosen Learning Outcomes:

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

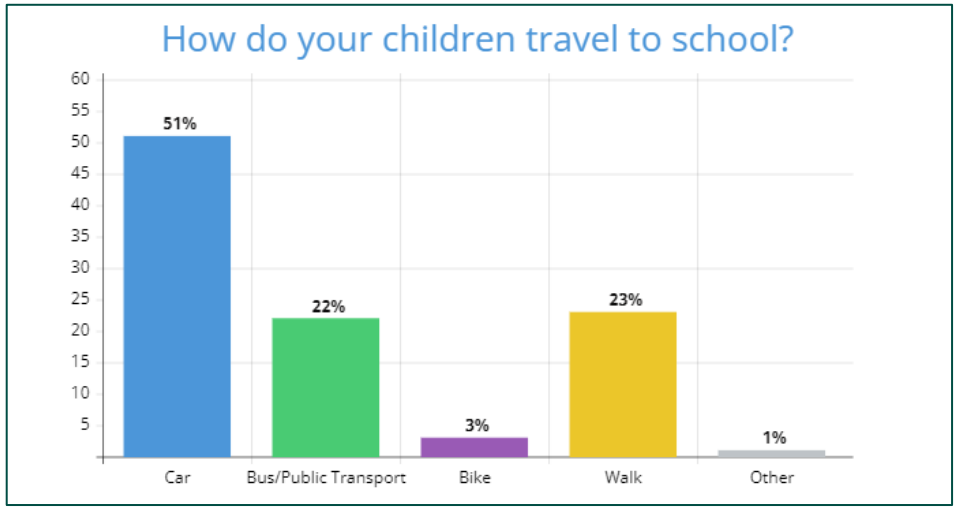
Key Learning:

- 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

How could the key learning be assessed?

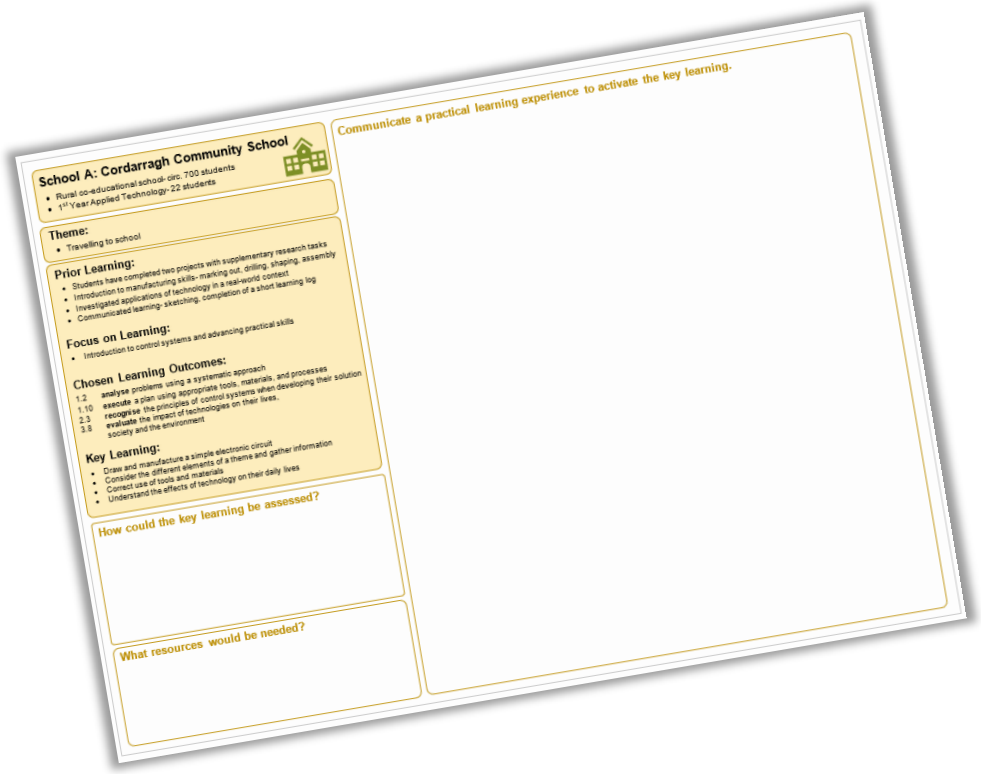
What resources would be needed?

Communicate a practical learning experience to activate the key learning.



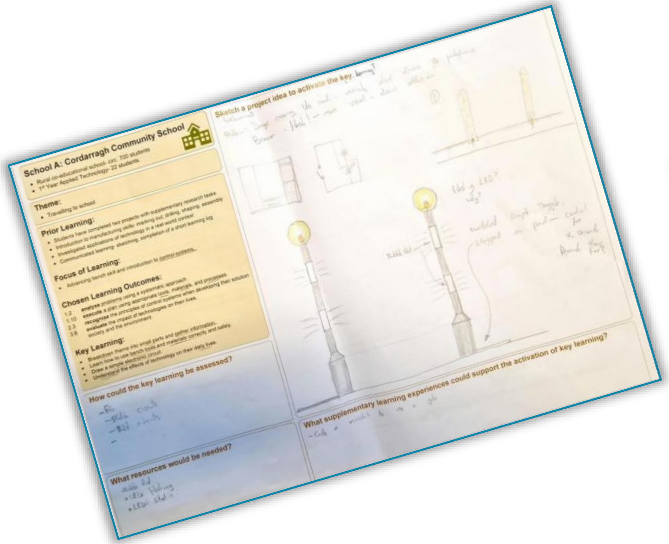
Using your A3 activity sheet, communicate a practical learning experience that allows students to experience the key learning identified

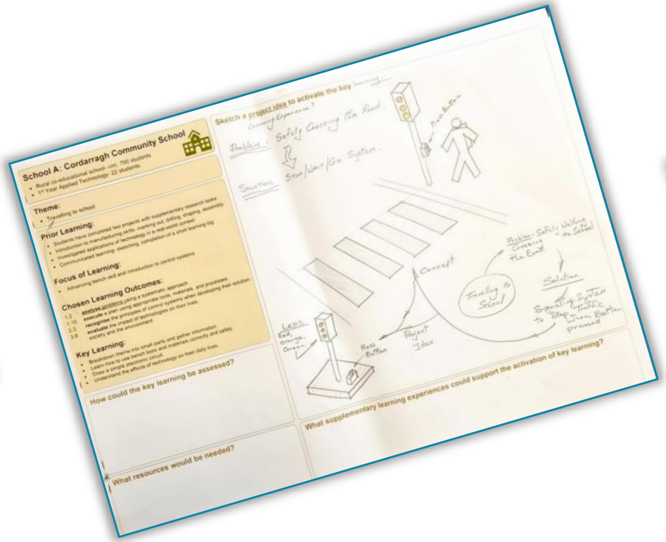
Communicating your Project Idea

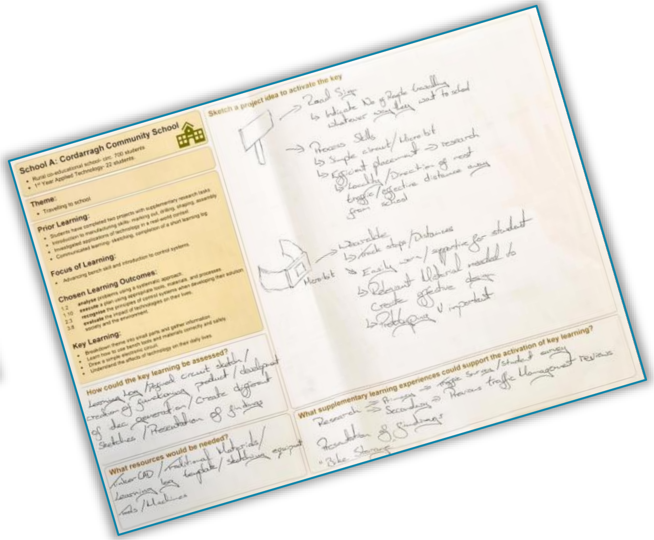


- Communicate a practical learning experience
- Assessment opportunities
- Resources

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.

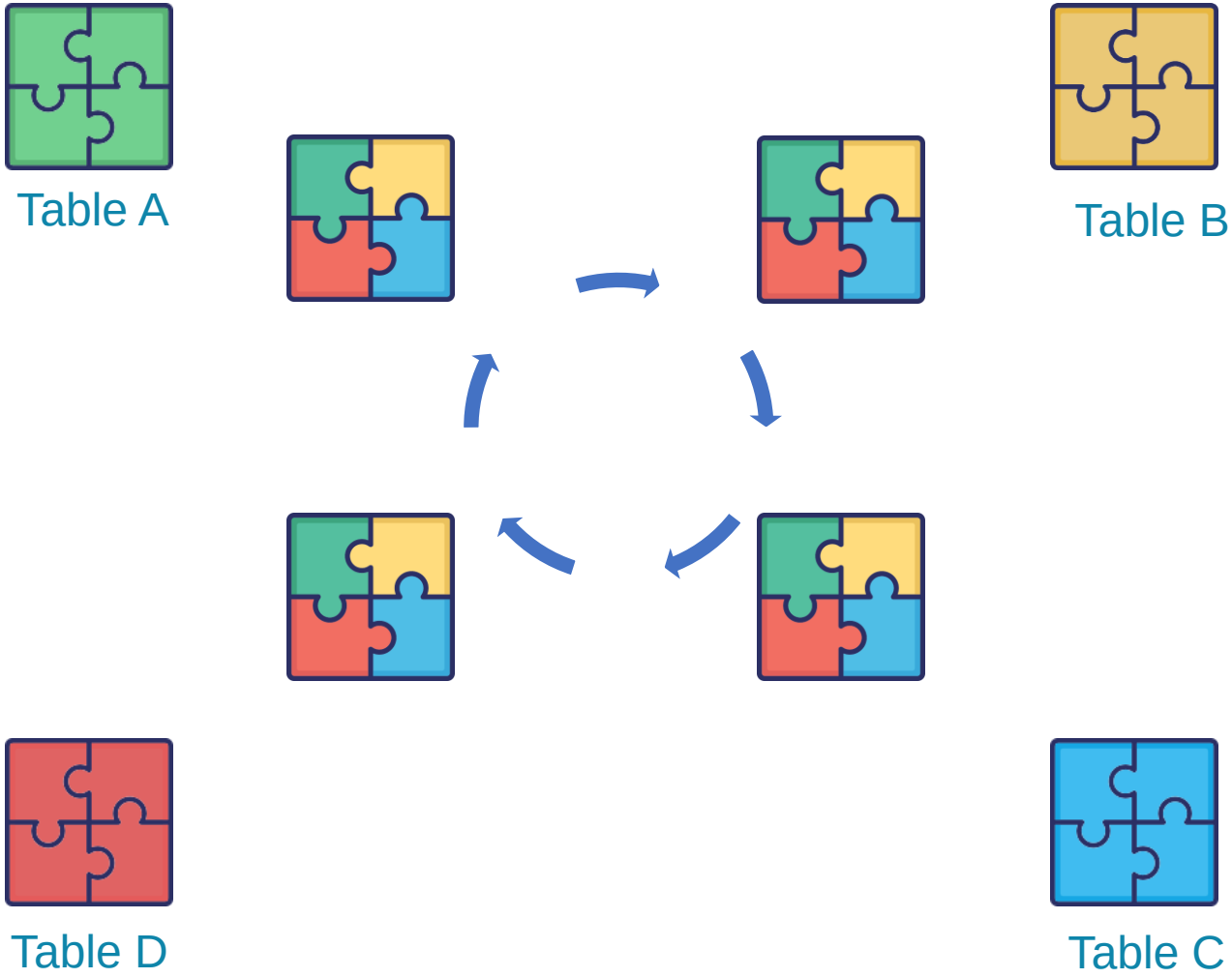
2. All the no.1 teachers should come together, no.2 teachers come together, etc.

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?

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

Pg. 7

Personal Reflection Moment

5 minutes

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

Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE 2023/2024

Session 3

CC BY NC

Themes for Today

Evolving Practice

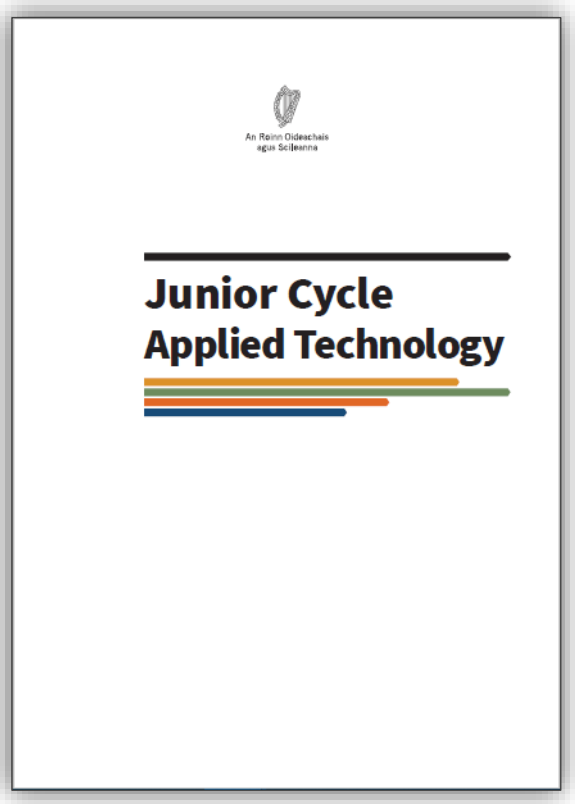
Focus on Learning

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



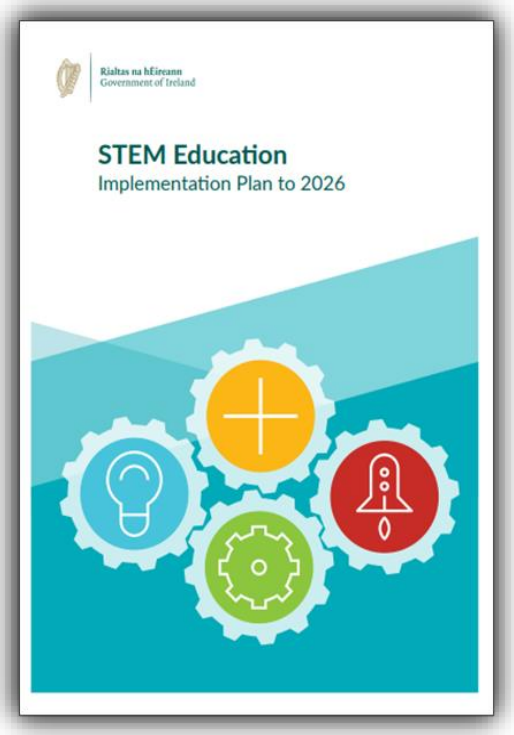
www.curriculumonline.ie

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.

STEM Education Implementation Plan to 2026

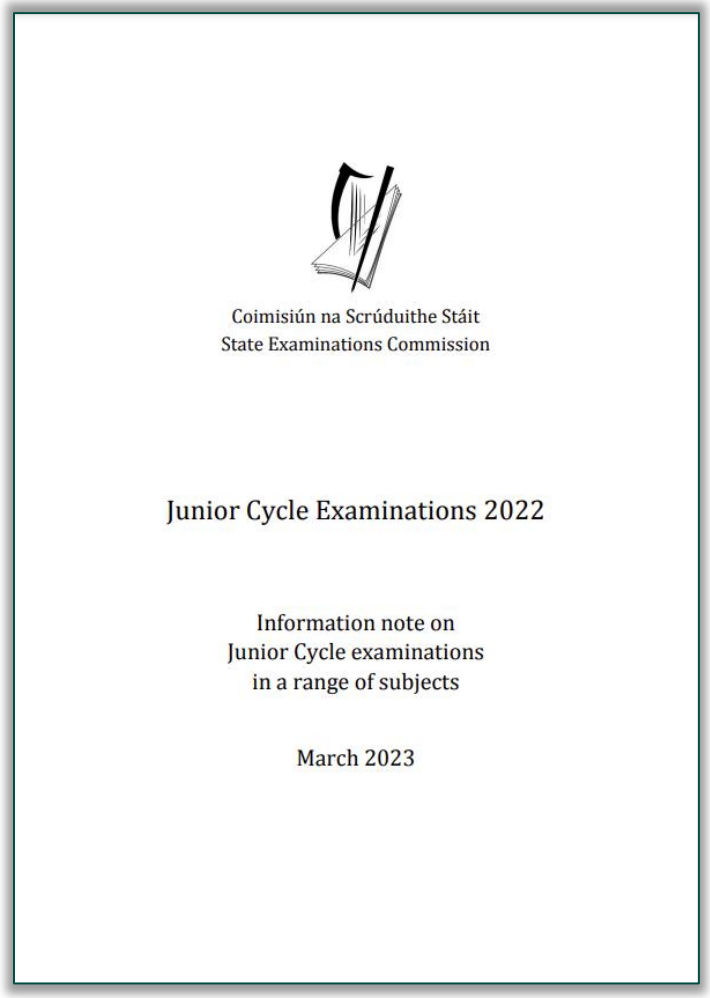


The Policy Statement vision for STEM education is that:

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

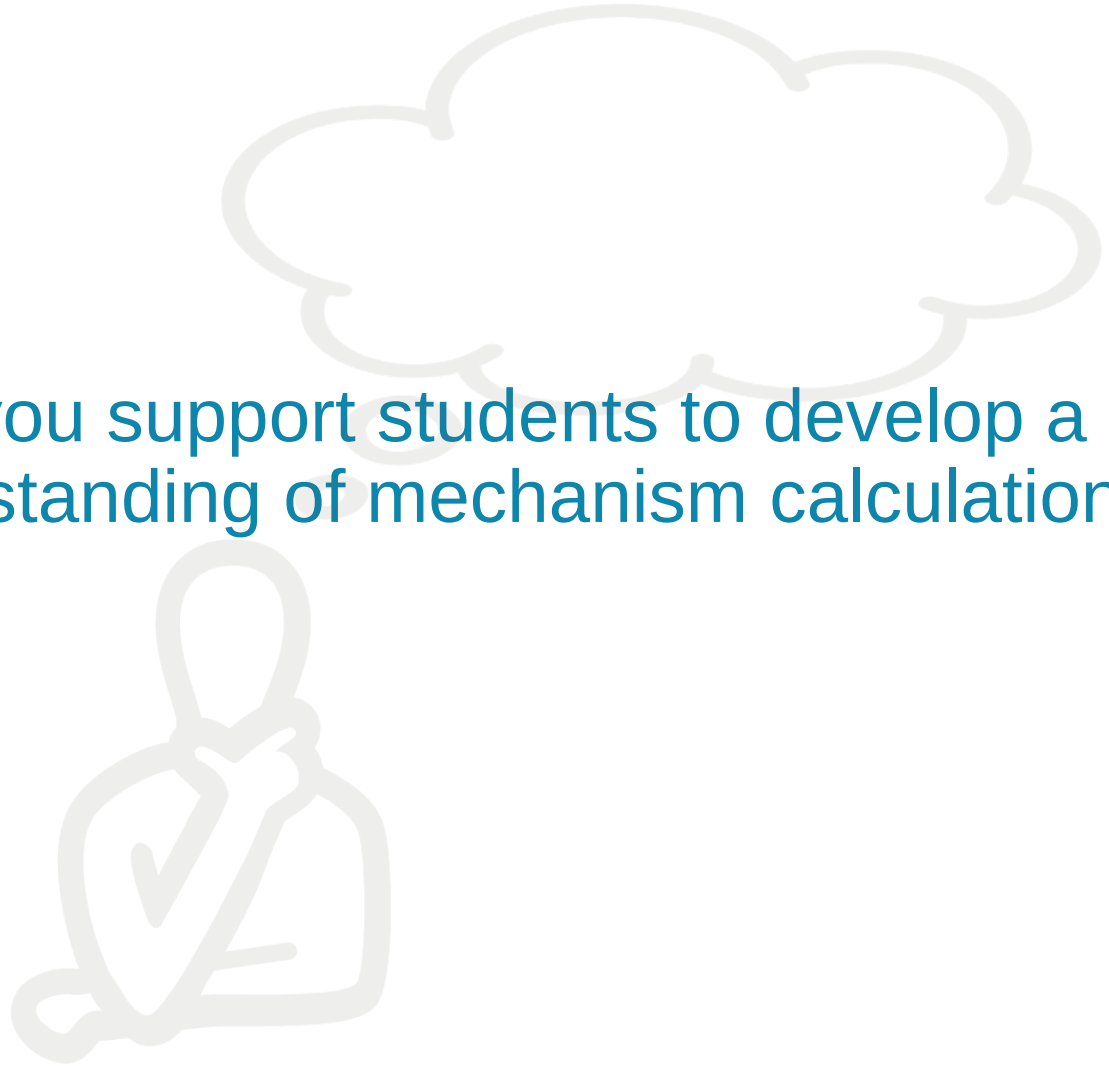
March 2023

"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?

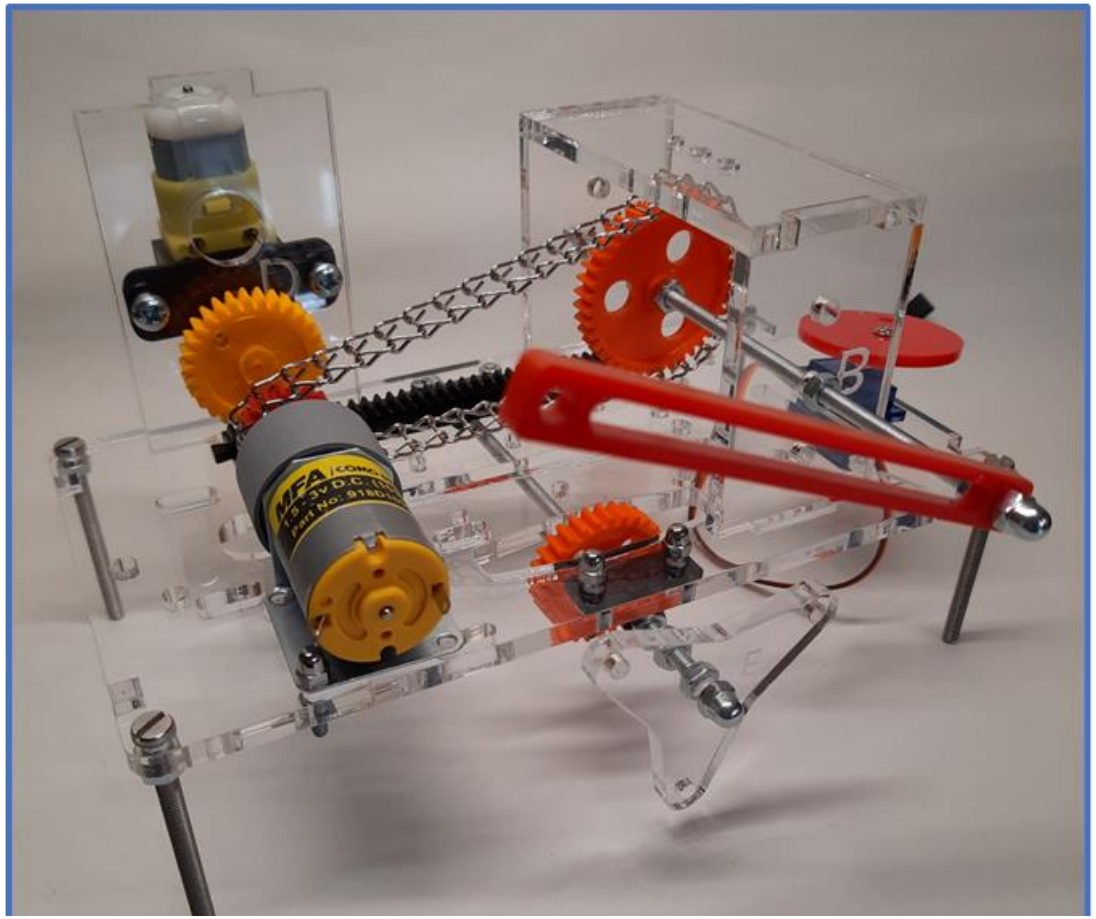


Through a practical learning experience, let’s explore how students can develop a better understanding of mechanism calculations

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

10 minutes

Teacher Activity 1:

10 minutes

Pg. 8

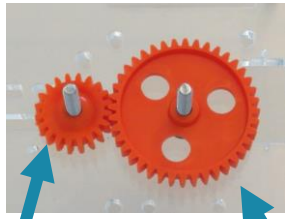
How can students learn
about gear ratios in a practical way?

Identify and Explain

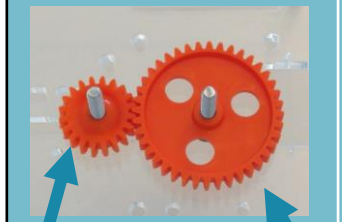
Key Terms

- Gear
- Meshing pair
- Driver
- Driven
- Teeth
- Rotation relationships
- Gear ratio
- Torque
- Mechanical advantage
- RPM

Investigate and Record



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
			

Rotations of **Driver** Gear	Rotations of **Driven** Gear	Gear Ratio

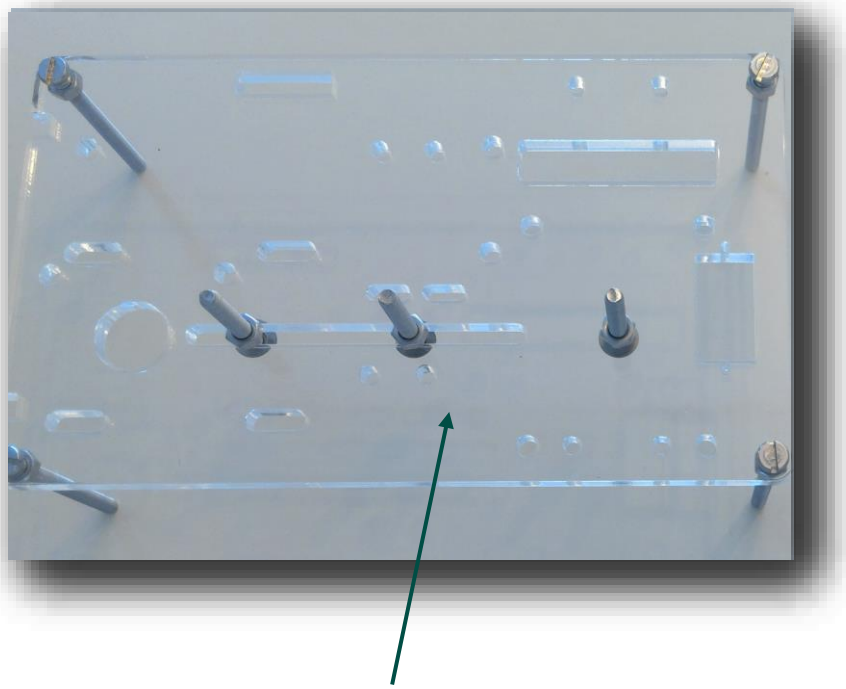
Driver

Driven

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

Pg. 9

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

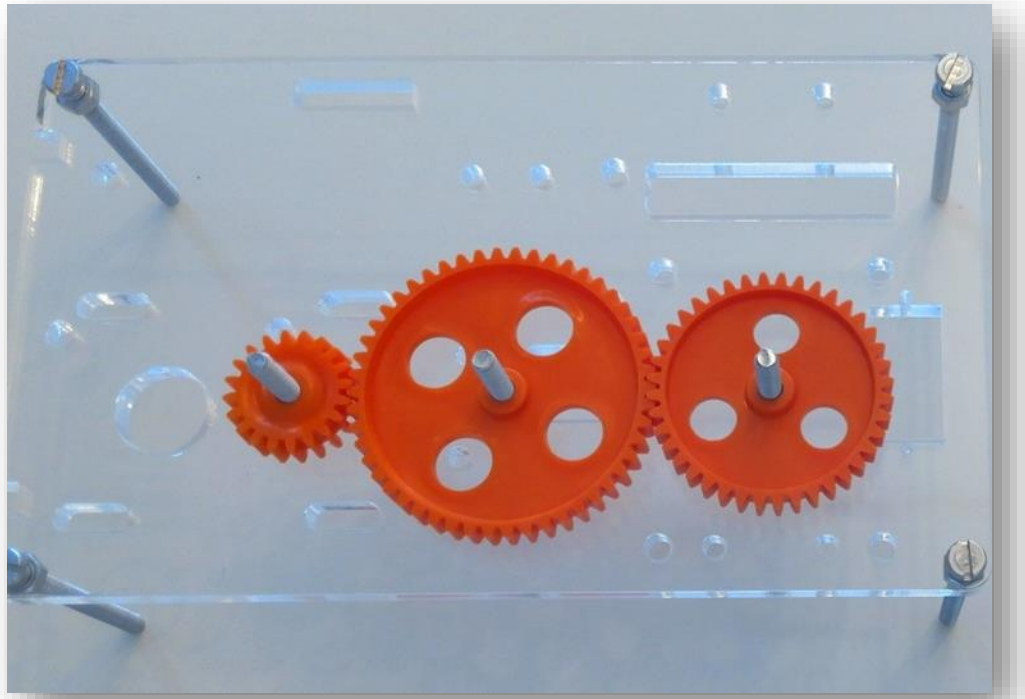


Idler gear

1. Adjust the position of the 40T and 20T gear
2. 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

10 minutes

Teacher Activity 2:



10 minutes

Pg. 10

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

Identify and Explain

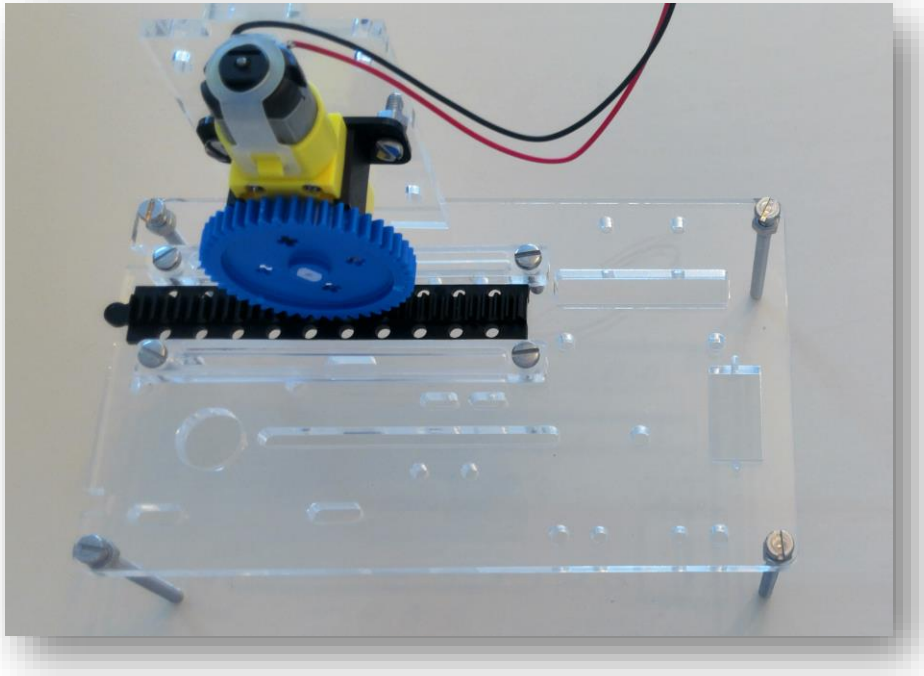
Idler gear

- 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

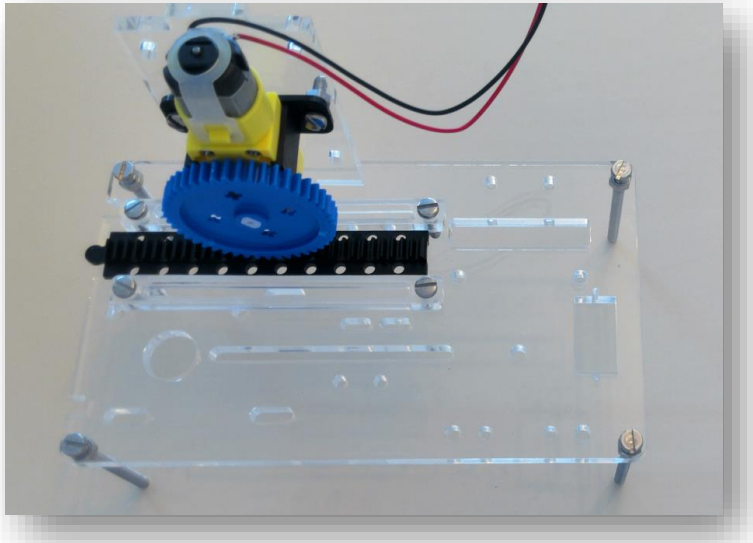


1. Click DC Motor and attachment into the base
2. Using M4 screws and nuts, assemble the 2 guides for the rack to the base
3. Place the rack between the guides and attach blue 40T pinion to the motor

10 minutes

Teacher Activity 3:

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



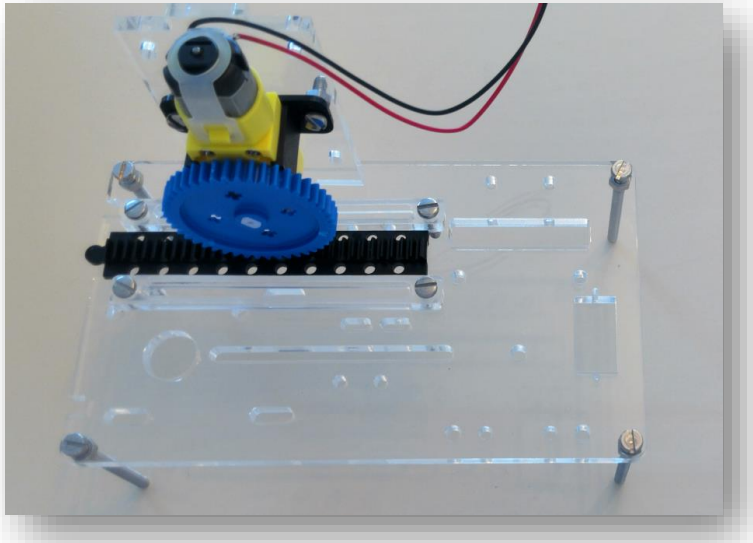
10 minutes

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



10 minutes

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

Pg. 11

Group Feedback & Discussion

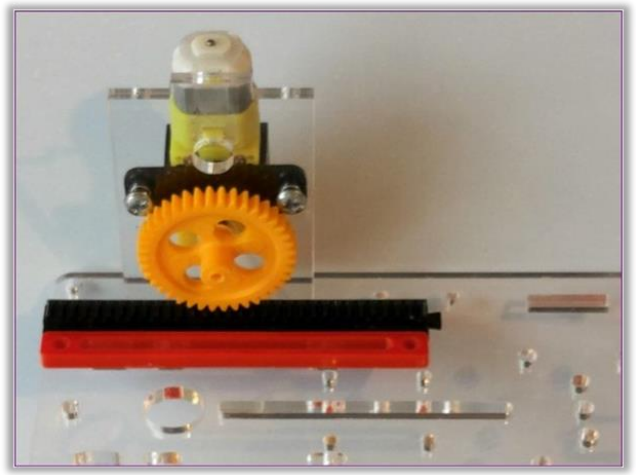
How can students learn about the distance a rack travels when driven by a pinion?

Personal Reflection Moment

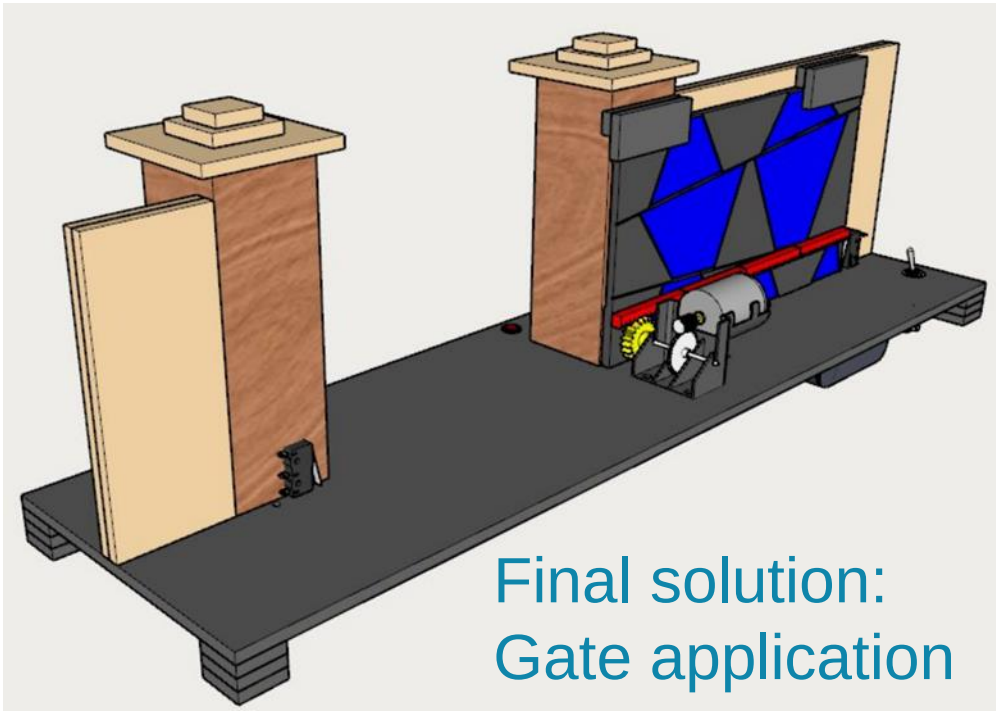
How can we support students to develop a better understanding of mechanism calculations?

Moving Forward…

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

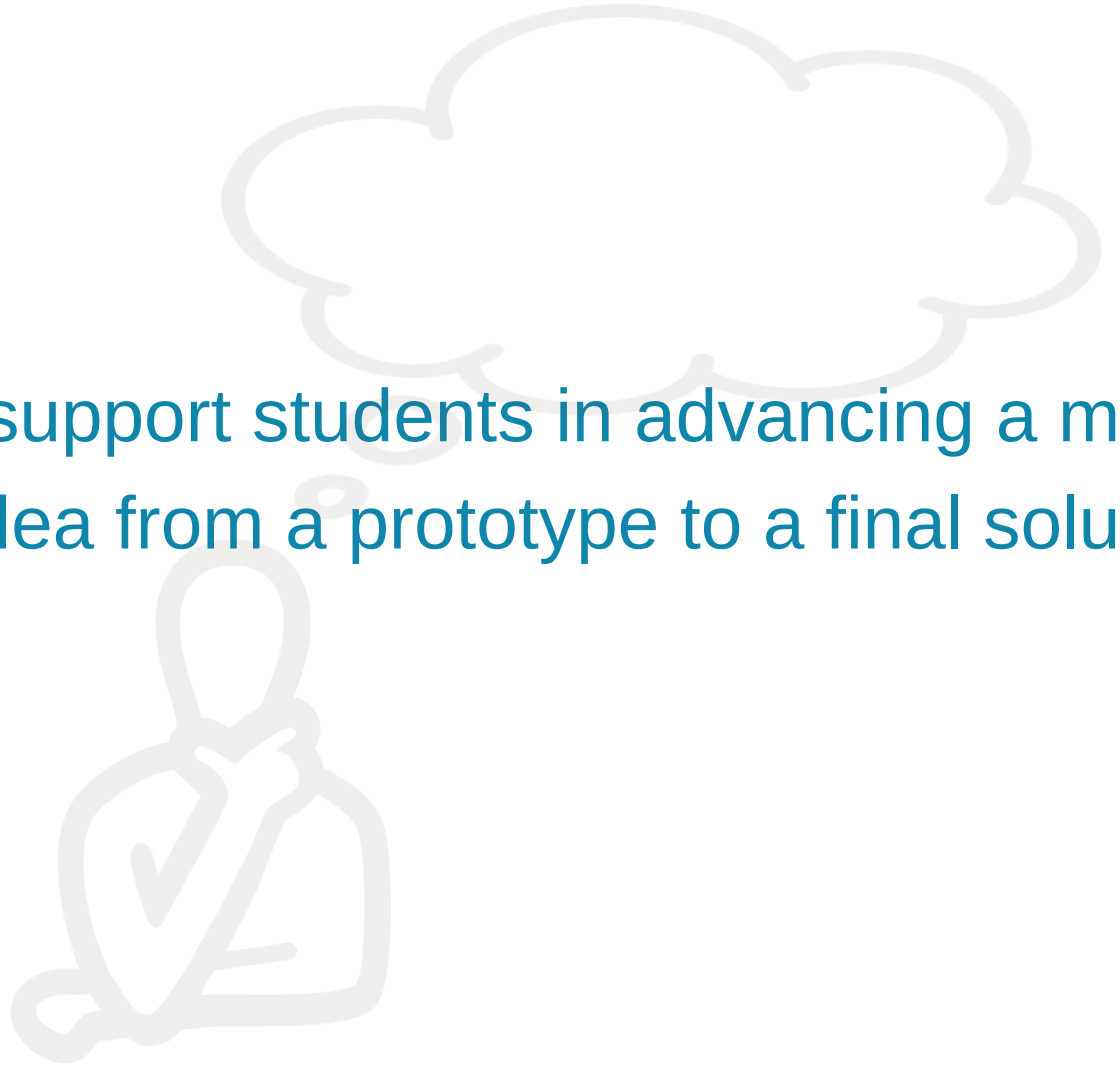


Prototype



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

Oide

Colman, St. Gerald's DLS College, Castlebar

St. Gerald's DLS College, Castlebar

St. Gerald's DLS College

Context:

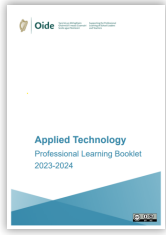
- Second Year group

- Focus:

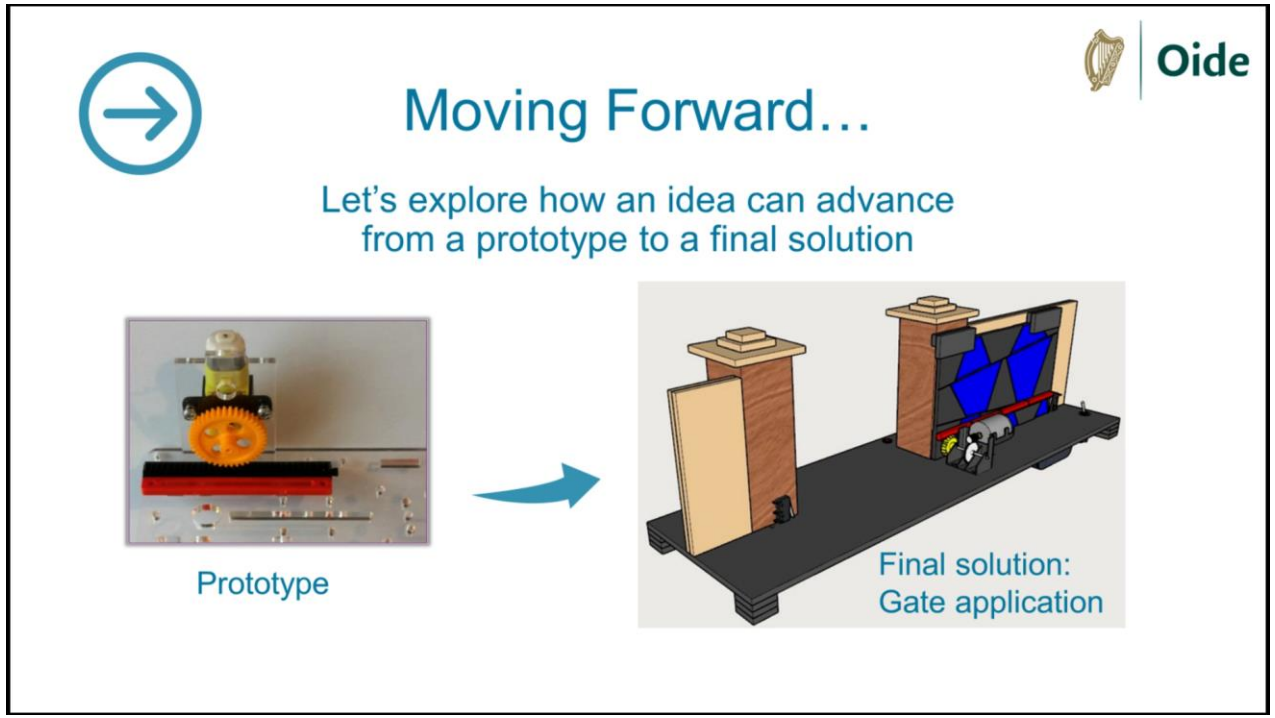
Students investigating the requirements for a rack and pinion system to solve a problem

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

Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE Day 2023 - 2024

Thank you for your participation in today's session

CC BY NC