Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE 2024/2025

CC BY NC

Meet the Team - Applied Technology

Oide

Seán Kehoe
Professional Learning Leader

Fergal Murphy
Professional Learning Leader

Barry Nolan
Senior Leader

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

www.oide.ie

Key Website / Online information

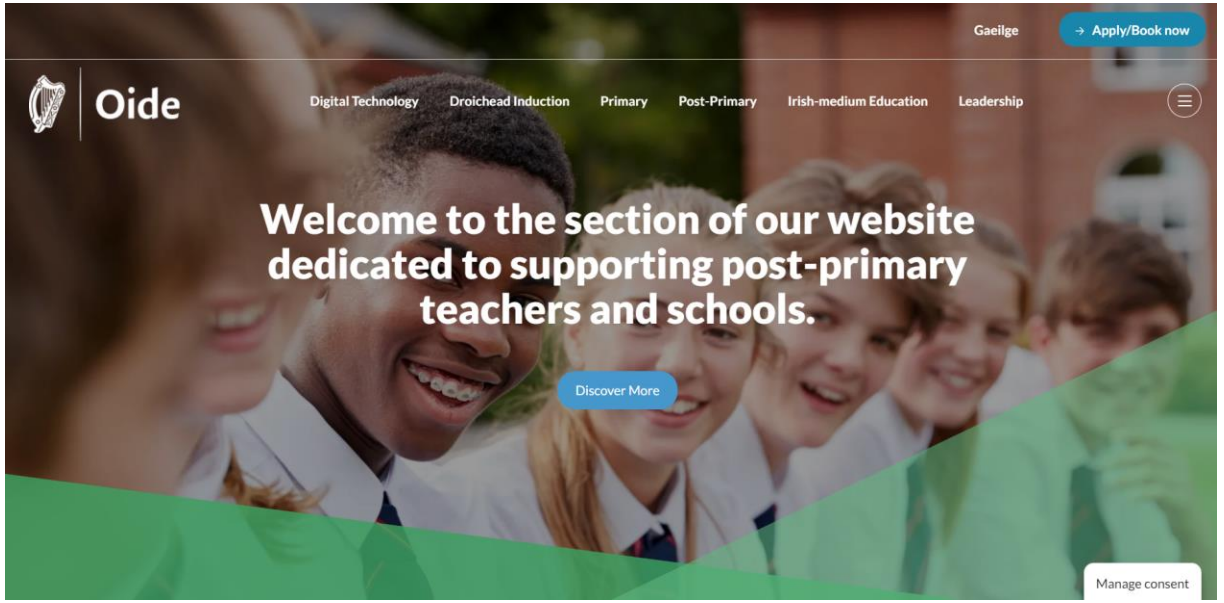
www.curriculumonline.ie

www.ncca.ie

www.oide.ie

𝕏 @Oide_PP_Tech4

E: info@oide.ie



Oide Mailing List

Updates

What is new in Applied Technology?

PLE 2023/2024 – Feedback

Further support with classroom practice

Electronics

Professional collaboration

Risk assessment

Analysis of skills

Support using electronic components and circuits

Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE 2024/2025

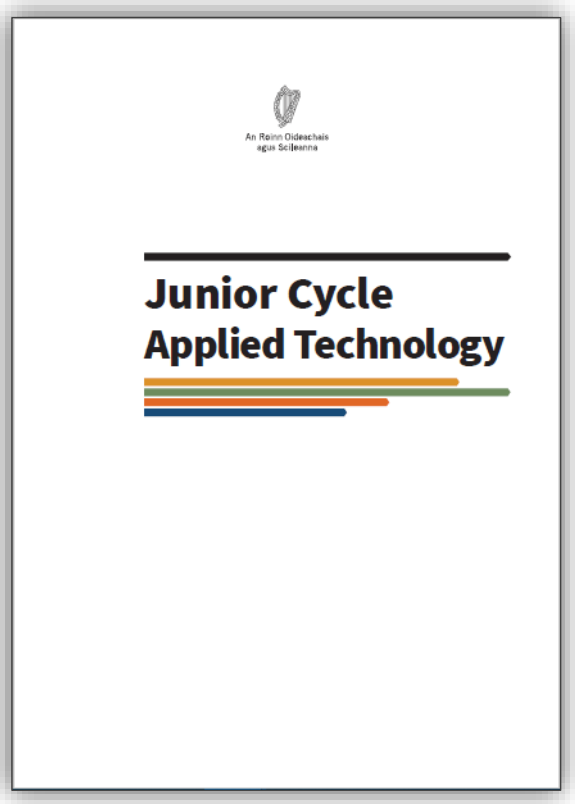
Session 1

CC BY NC

In this session, we will…

Through the lens of the fundamentals of electronics, consider teaching approaches to enhance knowledge, understanding, skills and values.

Applied Technology Specification



www.curriculumonline.ie

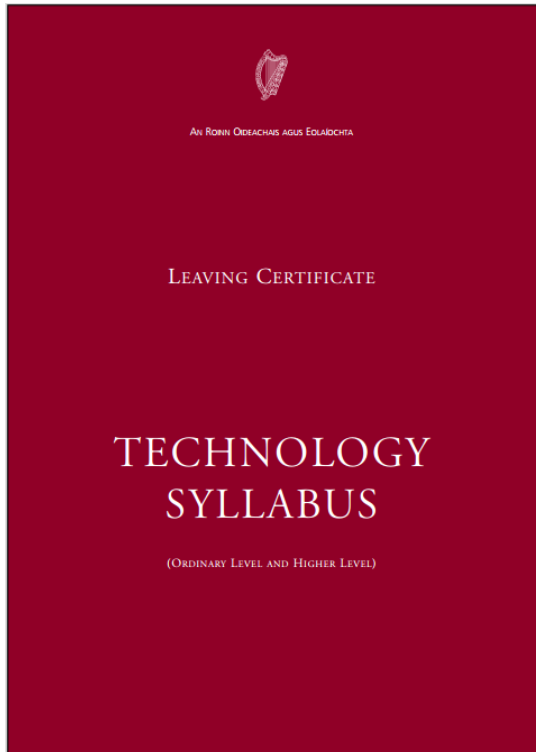
*Through the study of Applied Technology, students will have the opportunity to develop technological capability and literacy by engaging with a **broad range** of materials and systems.*

NCCA, Applied Technology specification, page 4.

Leaving Certificate Technology Syllabus

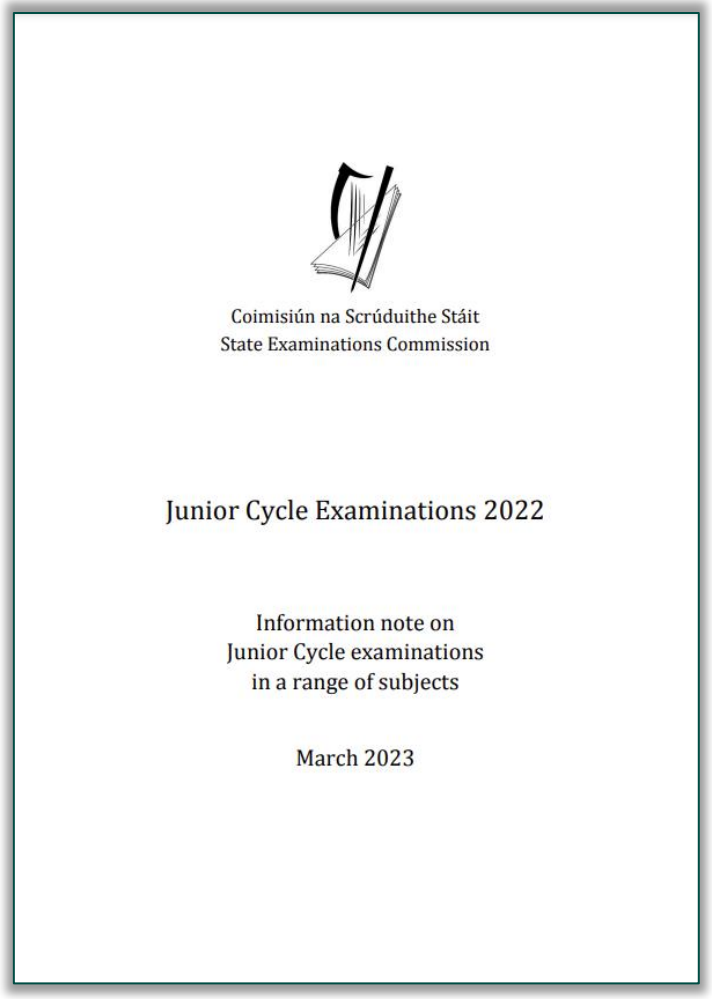
- *know basic technological principles and facts and the terminology associated with technology*

NCCA, Leaving Certificate Technology Syllabus, page 6.



www.curriculumonline.ie

SEC Information Note


Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Cycle Examinations 2022

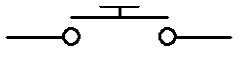
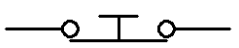
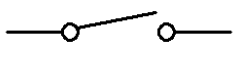
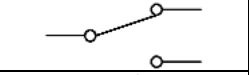
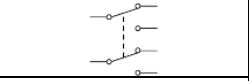
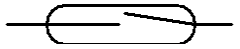
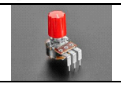
Information note on
Junior Cycle examinations
in a range of subjects

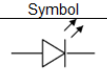
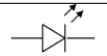
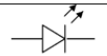
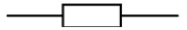
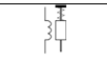
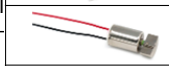
March 2023

Teachers should support candidates in recognising (physically and in circuit or symbolic format), understanding, and using common electronics components appropriately.

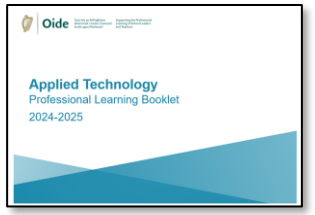
SEC, Information note on Junior Cycle examinations in a range of subjects, page 38.

Activity 1 – Matching Components

Components	Name	Symbol	Description
	Push to Make switch (PTM)		allows current to flow between its two contacts when pressed
	Push to Break Switch (PBM)		when the button is not pressed, current can flow, but when it is pressed the circuit is broken
	Single Pole Single Throw Switch (SPST)		a switch that controls one contact w
	Single Pole Double Throw Switch (SPDT)		a switch that control two contacts so that t
	Double Pole Double Throw Switch (DPDT)		Has two inputs and f control two separate c a
	Limit Switch / Micro Switch		a detection switch th make or pu
	Reed Switch		A mechanical swit mag
	Tilt Switch		A switch that opens c based on the s
	Rotary Switch		A switch that uses a r one of several

Components	Name	Symbol	Description
	MES LED		A diode that glows with a Miniature Edison Screw base connection
	Tri-Colour LED		A special kind of diode that can give off three different colours of light
	Full Colour LED		A special kind of diode that can produce a full range of colours
	LED Strip		Strip of LEDs
	LED		A special kind of diode that glows when electricity passes through it
	Resistor		Limits the flow of current in a circuit
	Buzzer		An audio signaling device, which may be mechanical, electromechanical, or piezoelectric.
	Solenoid		Uses an electric current to create a magnetic field that moves a metal core
	Miniature vibrating motor		A compact size electronic mechanism used as a signal device by vibrating
	Mini cooling fan		Uses a motor to move air to help lower temperatures

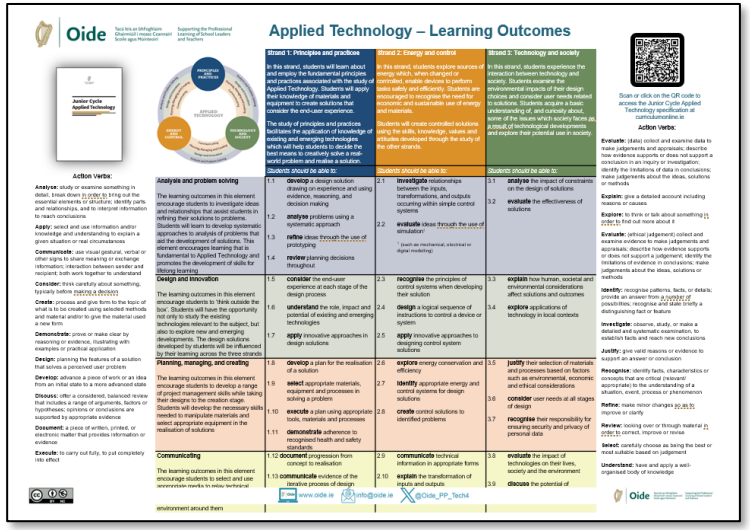
10 minutes



Using the stack of cards match the picture of the component with the name, symbol and description

Personal Reflection Moment

How do you decide which electronic components to introduce at different stages of the student learning journey?

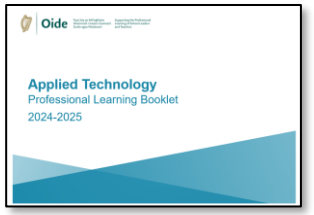


Group Feedback & Discussion

How do you decide which electronic components to introduce at different stages of the student learning journey?

Frequently Used Vs Not Used

10 minutes

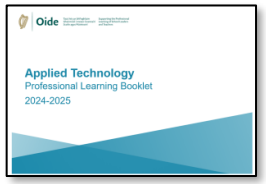


Activity 2 - Using the available input and output cards, categorise them into frequently used and not used

Activity 3 - Electronic Components: A Six-Year Reflection

Oide

6th Year — Term 1 — Term 2 — Term 3



5th Year — Term 1 — Term 2 — Term 3

T.Y.

3rd Yea

2nd Yea

Take the electronic components from your “Frequently used” group and consider the current most senior Applied Technology / Technology group.
Place the components on the six-year learning continuum at the point where the students engaged with these components for the first time.

1st Year — Term 1 — Term 2 — Term 3

CC BY NC

Open Floor Discussion

From the visual representation, what insights or surprises did you gain about the timing and frequency of use of the electronic components?
How might this impact your teaching approaches moving forward?

Looking at Our School 2022

Dimension 1: Learning and Teaching
Domain 2: Learner experiences

Students engage purposefully in meaningful learning activities	Students demonstrate high levels of interest and participation in learning.	Students demonstrate **very high** levels of interest and participation in learning.
	Students are able to learn both independently and collaboratively in a purposeful and creative manner.	Students are able to learn both independently and collaboratively in a **very purposeful, creative and productive** manner.
	Students understand and can explain the purpose of their learning tasks.	Students understand and can explain the purpose of their learning tasks, **and can extend and develop the activity meaningfully**.
	Students are able to report on, present, and explain the process and outcome of learning activities to a competent level.	Students are able to report on, present, and explain the process and outcome of learning activities to a **highly competent** level.
	management, critical thinking, resilience, resourcefulness and persistence.	time management, critical thinking, resilience, resourcefulness and persistence.

Classroom-based approach to understanding the principles of mechanical operation of input devices

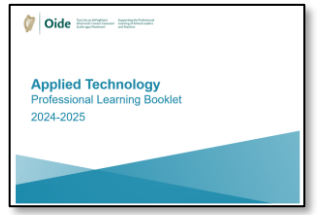
2.1 investigate relationships between the inputs, transformations, and outputs occurring within simple control systems

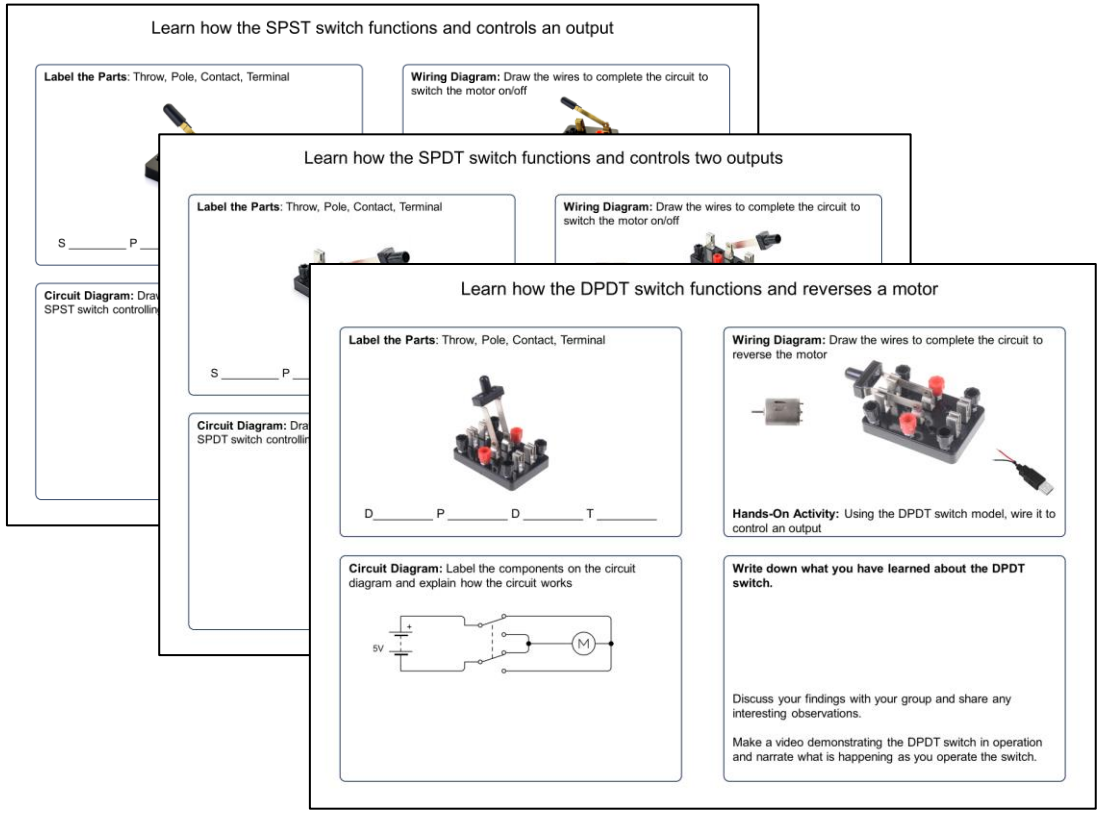
2.10 explain the transformation of inputs and outputs

Personal Reflection Moment

How do you develop understanding with your students of the mechanical operation of input devices?

Classroom-based approach to understanding the principles of mechanical operation of input devices





Activity 4 - Using the model of one of the switches, and with the aid of the activity sheet, investigate and record the principles of mechanical operation of the switch

Group Feedback & Discussion

What are the benefits to the students in this activity?

How could you adapt this approach to aid your students in understanding the mechanical operation of a range of input devices?

Looking at Our School 2022

Dimension 1: Learning and Teaching
Domain 2: Learner experiences

Students engage purposefully in meaningful learning activities	Students demonstrate high levels of interest and participation in learning.	Students demonstrate **very high** levels of interest and participation in learning.
	Students are able to learn both independently and collaboratively in a purposeful and creative manner.	Students are able to learn both independently and collaboratively in a **very purposeful, creative and productive** manner.
	Students understand and can explain the purpose of their learning tasks.	Students understand and can explain the purpose of their learning tasks, **and can extend and develop the activity meaningfully**.
	Students are able to report on, present, and explain the process and outcome of learning activities to a competent level.	Students are able to report on, present, and explain the process and outcome of learning activities to a **highly competent** level.
	management, critical thinking, resilience, resourcefulness and persistence.	time management, critical thinking, resilience, resourcefulness and persistence.

In this session, we…

Through the lens of the fundamentals of electronics, considered teaching approaches to enhance knowledge, understanding, skills and values.

Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE 2024/2025

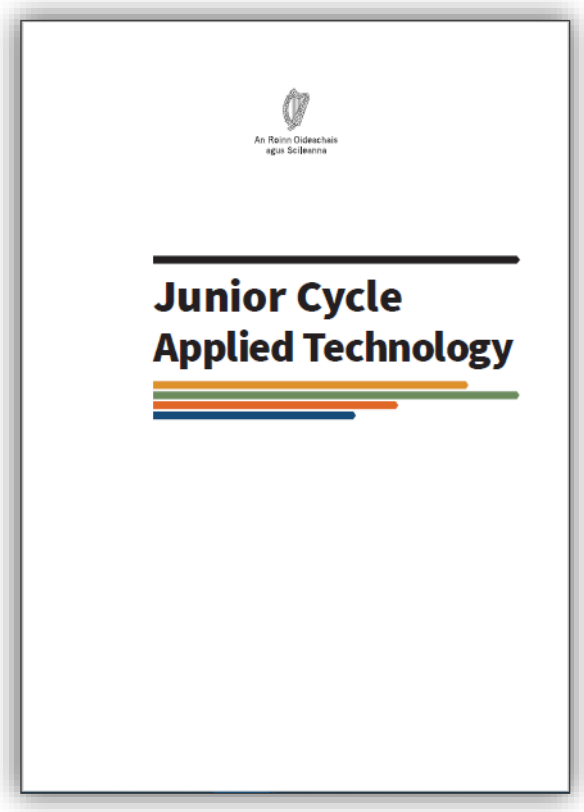
Session 2

CC BY NC

In this session, we will…

Explore creativity and problem-solving skills through the lens of the fundamentals of electronics.

Applied Technology Specification



www.curriculumonline.ie

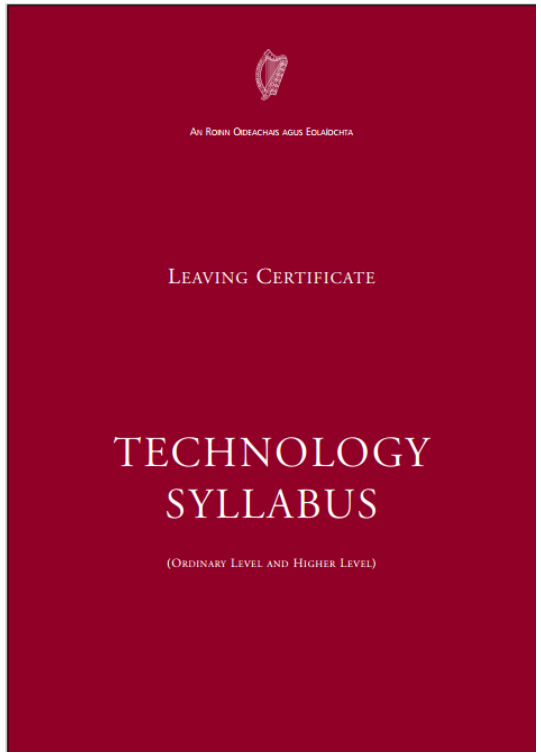
*Students will develop an **understanding** of the principles of energy and **control** to **resolve practical problems**. Students will have the freedom to explore design and systems thinking through an iterative process to conceive, refine, realise and evaluate ideas.*

NCCA, Applied Technology specification, page 4.

Leaving Certificate Technology Syllabus

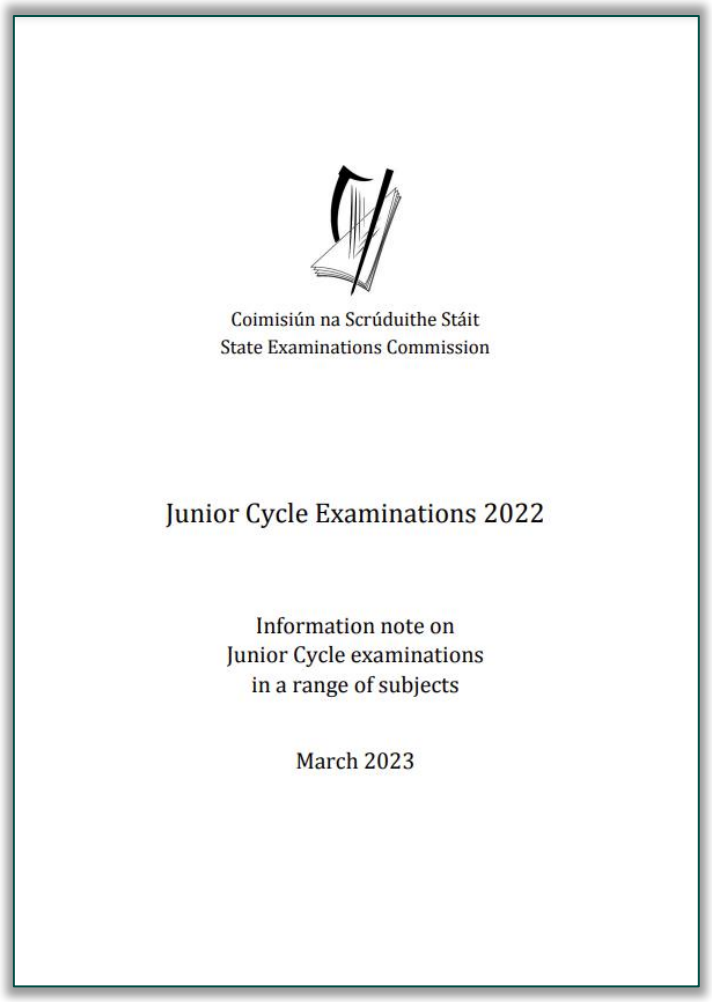
- *be able to work both independently and co-operatively in evaluating existing solutions and in proposing novel/creative solutions to technological challenges*

NCCA, Leaving Certificate Technology Syllabus, page 6.



www.curriculumonline.ie

SEC Information Note


Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Cycle Examinations 2022

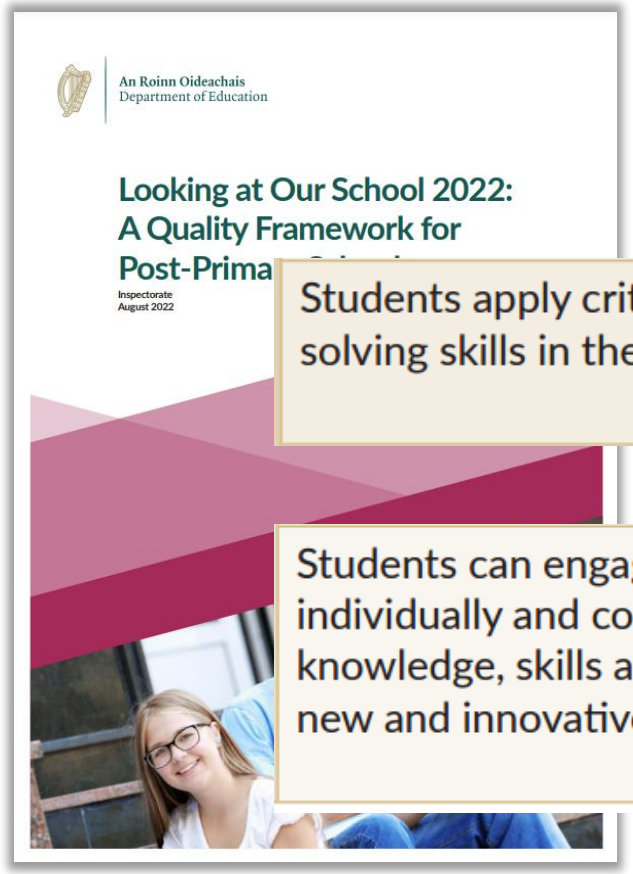
Information note on
Junior Cycle examinations
in a range of subjects

March 2023

The integration of learning from all three strands of the Applied Technology specification should be planned. Careful planning allows opportunities for candidates to explore underpinning theory while also learning about tools, materials, and processes and the applied aspects of the subject

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

Looking at Our School 2022



Dimension 1: Learning and Teaching
Domain 1: Learner outcomes

Students have the necessary	Students demonstrate a knowledge, appropriate to their stage of development, of their own	Students demonstrate a knowledge, appropriate to their stage of development, of their own behaviour
	Students apply critical thinking and problem-solving skills in their approach to their learning.	Students apply critical thinking and problem-solving skills in their approach to their learning **and develop as autonomous learners.**
relationships		**to do so themselves.**
	Students apply critical thinking and problem-	Students apply critical thinking and problem-
	Students can engage in creative processes individually and collaboratively that develop their knowledge, skills and understanding and result in new and innovative ideas and solutions.	Students can engage in creative processes individually and collaboratively that **transform** their knowledge, skills and understanding resulting in new and innovative ideas and solutions **that have value in real world applications.**

Personal Reflection Moment

How do you develop creativity and problem-solving skills in your classroom?

Unit of Learning

Context:

- 2nd Year Applied Technology Term 1

Prior Learning

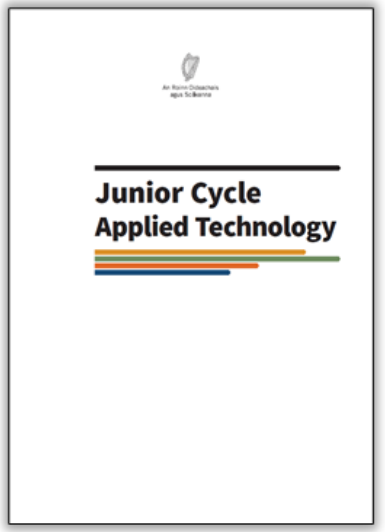
- Students have completed a Unit of Learning to develop their understanding of simple electronics, including battery pack, SPST, LED, resistor
- Completed design and research tasks, and soldered a circuit
- Communicated technical information in the form of circuit diagrams and wiring diagrams

Focus of Learning

- Explore creativity and problem solving through prototyping with a variety of electronic input and output components

Chosen Learning Outcomes

1.3 refine ideas through the use of prototyping
2.5 apply innovative approaches to designing control system solutions
2.8 create control solutions to identified problems
3.6 consider user needs at all stages of design



1.3

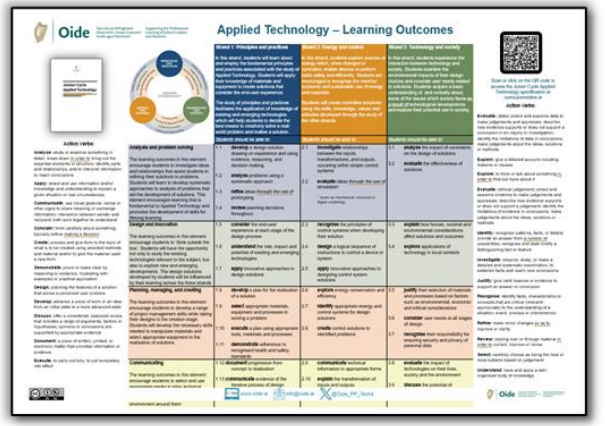
2.5

2.8

3.6

Key Learning

- Develop an understanding of the function of a range of electronic components
- Research and design a creative solution of an electronic subsystem suitable for a particular requirement/need
- Through prototyping design creative solutions to fulfil a brief and manufacture a simple electronic circuit



Unit of Learning

Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Student Context:

- 2nd year Applied Technology Term 1

Prior Learning:

- Students have completed a Unit of Learning to develop their understanding of simple electronics including battery pack, SPST, LED, resistor
- Completed design and research tasks and soldered a circuit
- Communicated technical information in the form of circuit diagrams and wiring diagrams

Focus of Learning:

Explore creativity and problem solving through prototyping with a variety of electronic input and output components

Chosen Learning Outcomes:

1.3	refine ideas through the use of prototyping
2.5	apply innovative approaches to designing control system solutions
2.8	create control solutions to identified problems
3.6	consider user needs at all stages of design

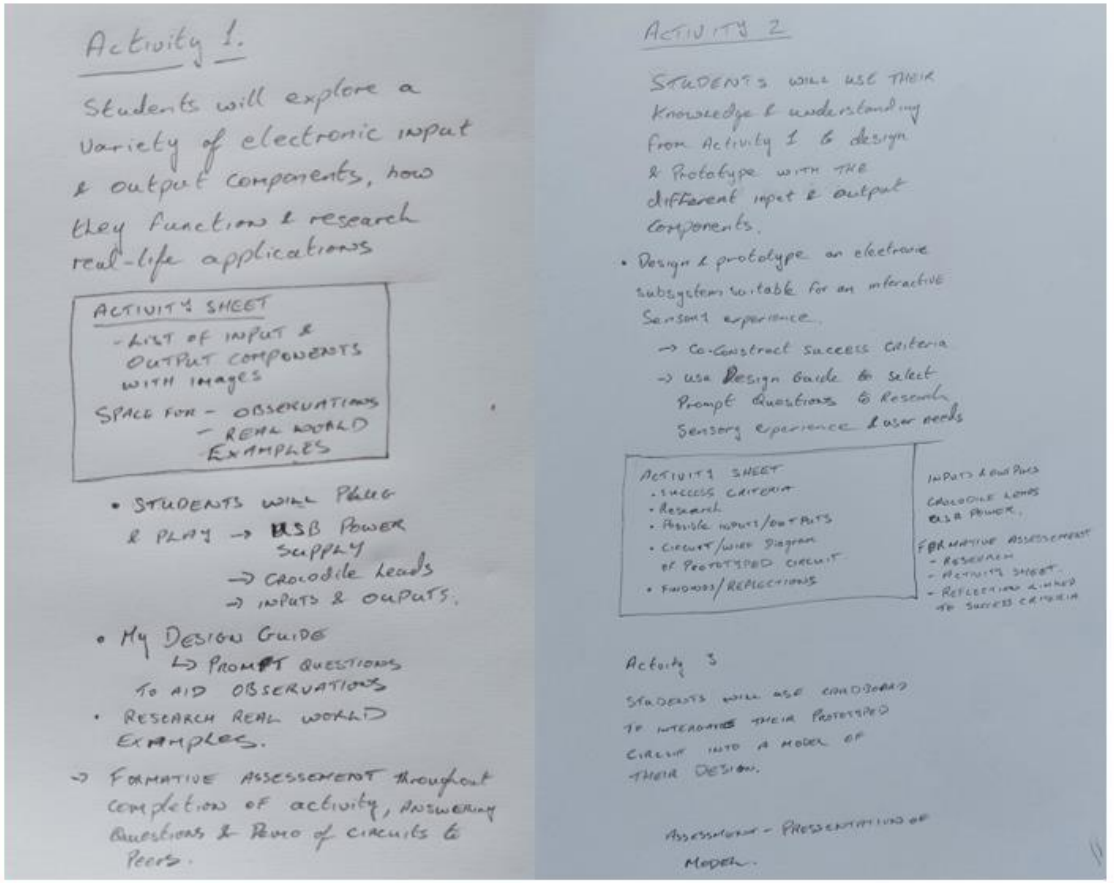
Key Learning:

- Develop an understanding of the function of a range of electronic components
- Research and design a creative solution of an electronic subsystem suitable for a particular requirement/need
- Through prototyping design creative solutions to fulfil a brief

Length of unit:

6 one-hour classes

Communicate a practical learning experience to activate key learning:



What resources would be needed?

Spade connectors
Crocodile clips
USB power supply
USB power lead
Selection of input and output components
Activity sheets
My Design Guide

How could the key learning be assessed?

Completion of the activity sheet to demonstrate knowledge and understanding of how the electronic components function and give real world examples
Complete and working circuit that fulfils the brief
Peer feedback on co-constructed success criteria throughout
Learning log to sketch and record design ideas and self reflection

CC BY NC

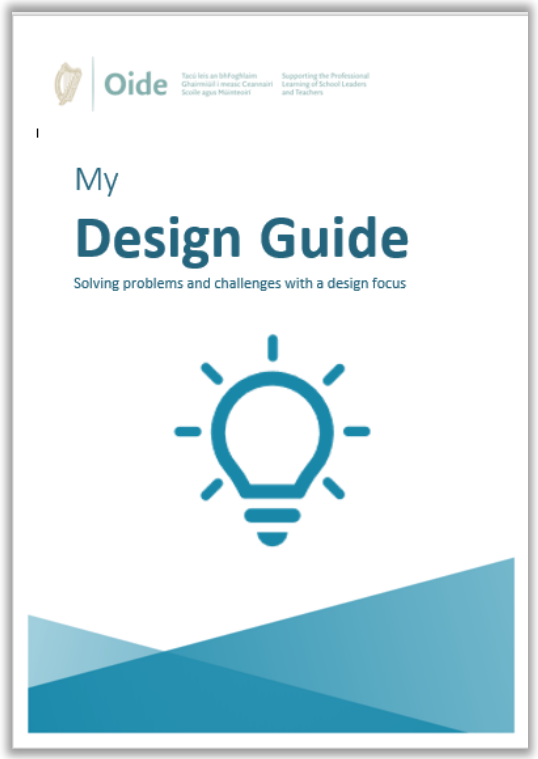
Enacting the Learning

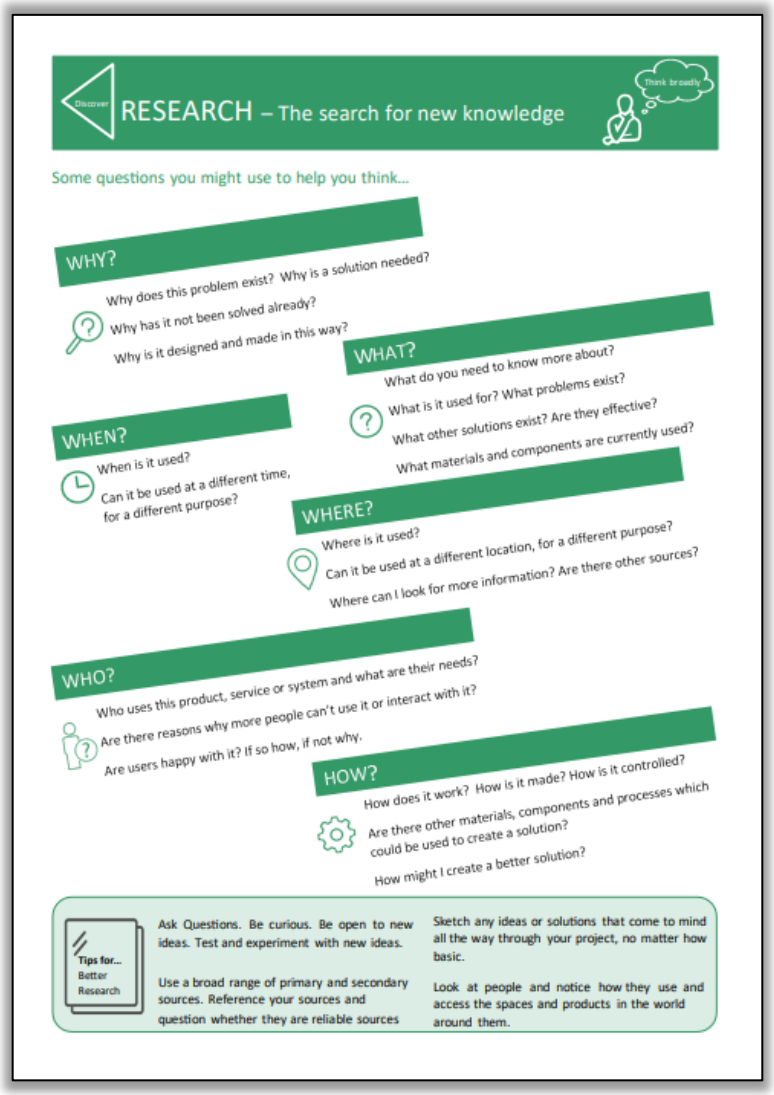
Let's explore how a variety of electronic input and output components function through a hands-on activity

Real world example	Observations	Input components
		Push to Make switch (PTM)
		Push to Break Switch (PBM)
		Single Pole Single Throw Switch (SPST)
		Single Pole Double Throw Switch (SPDT)
		Double Pole Double Throw Switch (SPDT)
		Limit Switch / Micro Switch
		Reed Switch
		Tilt Switch
		Rotary Switch

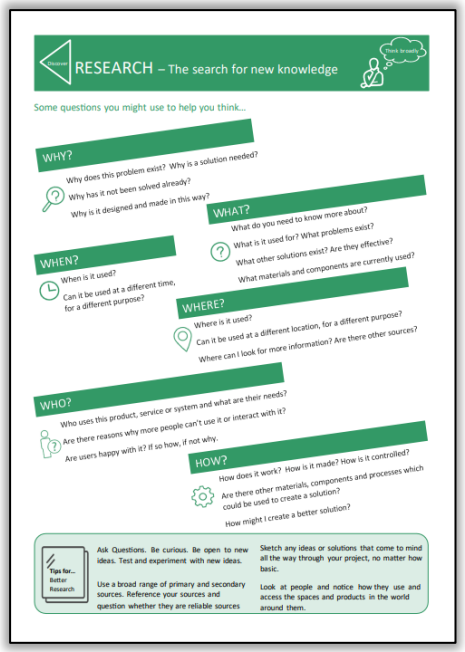
Output components	Observations	Real world example
MES LED		
Tri-Colour LED		
Full Colour LED		
LED Strip		
Buzzer		
Solenoid		
Resistor		
Miniature vibrating motor		
LED		
Cooling Fan		
DC motor		

Supporting students exploring a variety of electronic components





Questions from My Design Guide to aid observations



RESEARCH – The search for new knowledge

Some questions you might use to help you think...

WHY?

Why does this problem exist? Why is a solution needed?

Why has it not been solved already?

Why is it designed and made in this way?

WHAT?

What do you need to know more about?

What is it used for? What problems exist?

What other solutions exist? Are they effective?

What materials and components are currently used?

WHEN?

When is it used?

Can it be used at a different time, for a different purpose?

WHERE?

Where is it used?

Can it be used at a different location, for a different purpose?

Where can I look for more information? Are there other sources?

WHO?

Who uses this product, service or system and what are their needs?

Are there reasons why more people can't use it or interact with it?

Are users happy with it? If so how, if not why.

HOW?

How does it work? How is it made? How is it controlled?

Are there other materials, components and processes which could be used to create a solution?

How might I create a better solution?

Tips for... Better Research

Ask Questions. Be curious. Be open to new ideas. Test and experiment with new ideas.

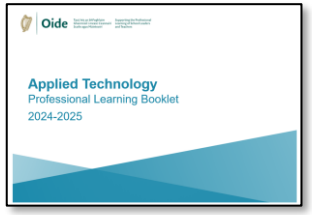
Use a broad range of primary and secondary sources. Reference your sources and question whether they are reliable sources

Sketch any ideas or solutions that come to mind all the way through your project, no matter how basic.

Look at people and notice how they use and access the spaces and products in the world around them.

- How does it work?
- When is it used?
- What do you need to know more about?
- What other solutions exist?
- Why is it designed and made in this way?
- Who uses this product, service, or system and what are their needs?

Activity 5



Instructions:

1. From your group of not used inputs and outputs randomly select one of each.
2. Using the crocodile leads, spade connectors and power supply get the input component to control the output component.
3. Record your observations of how each component functions and research real world examples of each.
4. Repeat step 1 to 3 for the other electronic components.

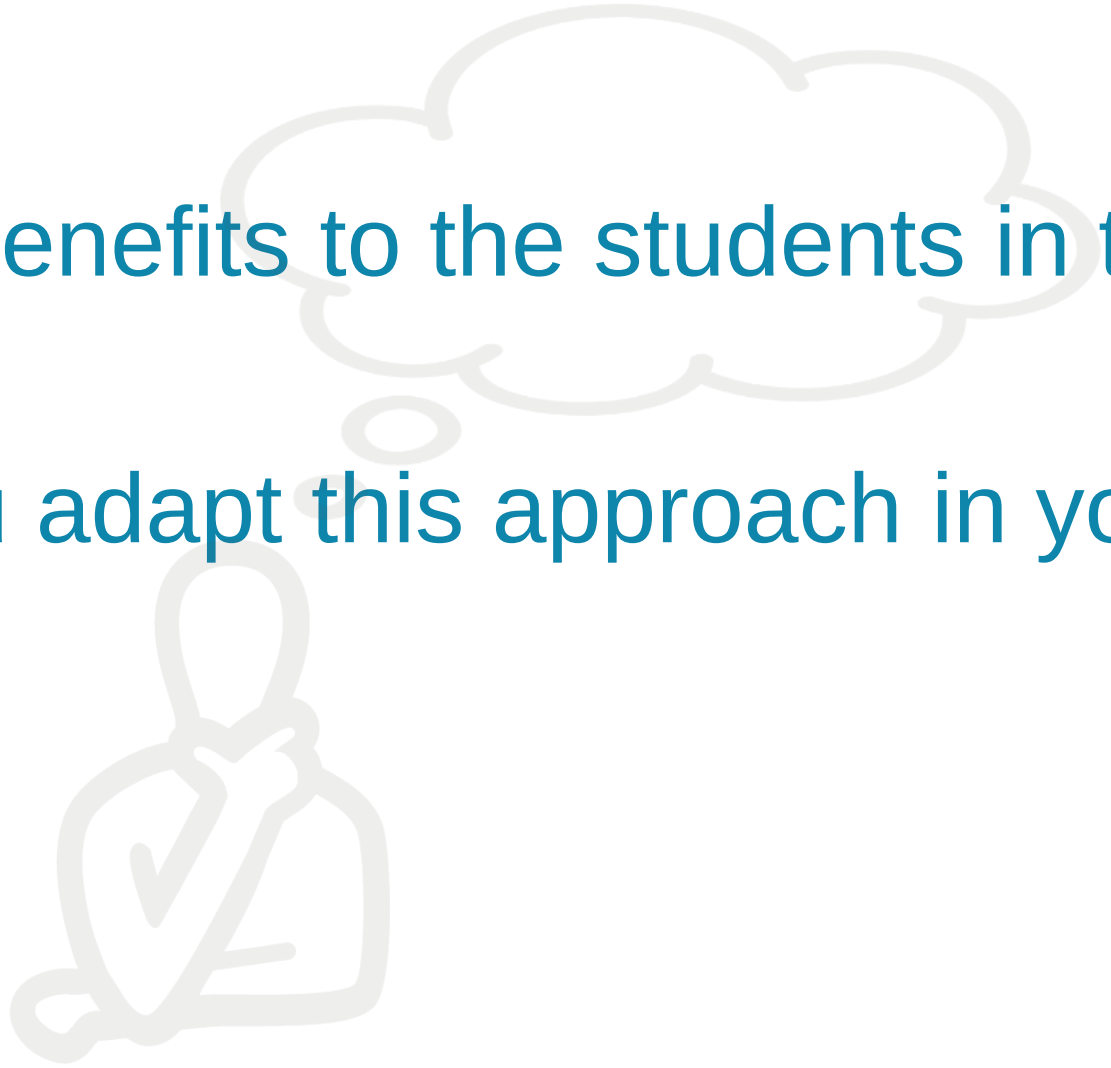
Real world example	Observations	Input components
		Push to Make switch (PTM)
		Push to Break Switch (PBM)
		Single Pole Single Throw Switch (SPST)
		Single Pole Double Throw Switch (SPDT)
		Double Pole Double Throw Switch (DPDT)
		Limit Switch / Micro Switch
		Reed Switch
		Tilt Switch
		Rotary Switch

Output components	Observations	Real world example
MES LED		
Tri-Colour LED		
Full Colour LED		
LED Strip		
Buzzer		
Solenoid		
Resistor		
Miniature vibrating motor		
LED		
Cooling Fan		
DC motor		

Group Feedback & Discussion

What are the benefits to the students in this activity?

How could you adapt this approach in your context?



Focus Question

What role does prototyping play in the design journey?

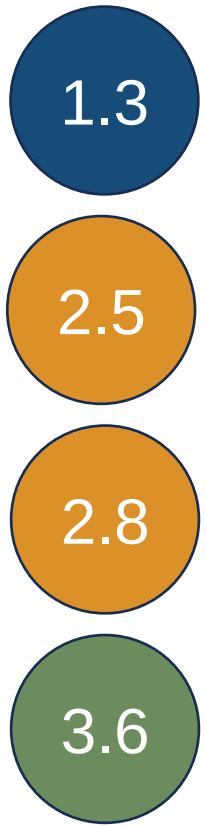
1.3

2.5

RTÉ Big Life Fix – real world prototyping

- Available on RTÉ player

- https://www.rte.ie/player/series/big-life-fix/SI00000006774?epguid=IP000067855



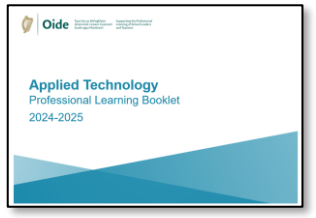
Reflection Point

What role did prototyping play in the design journey?

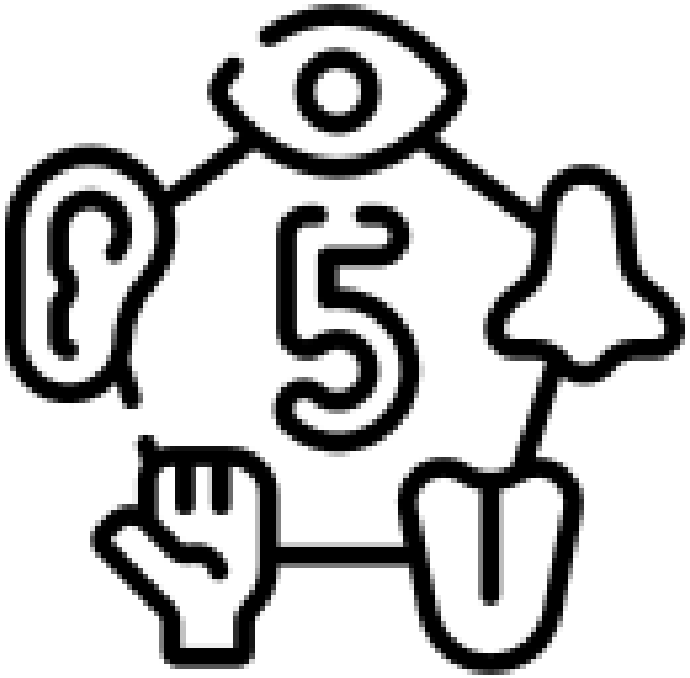
1.3

2.5

Enacting the Learning



- Activity 6 - Design and prototype an electronic subsystem suitable for an interactive sensory experience



Name:

Task: Design and prototype an electronic subsystem suitable for an interactive sensory experience

Success Criteria:
The electronic subsystem/prototype should have:

Resources:

Research:

Possible wire diagram(s):

Circuit diagram:

Findings/Reflections

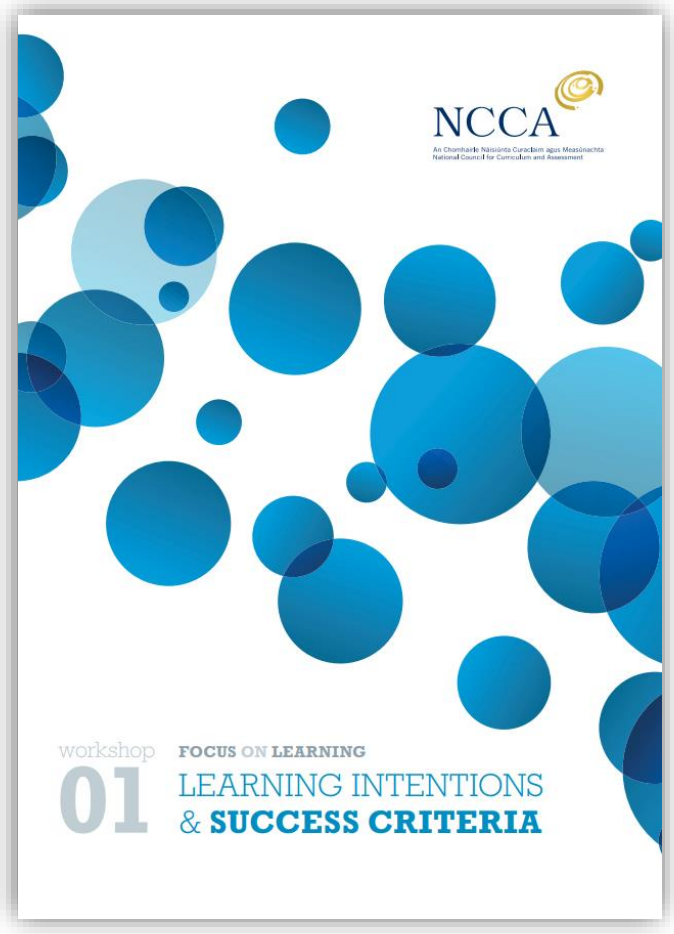
1.3

2.5

2.8

3.6

Success Criteria

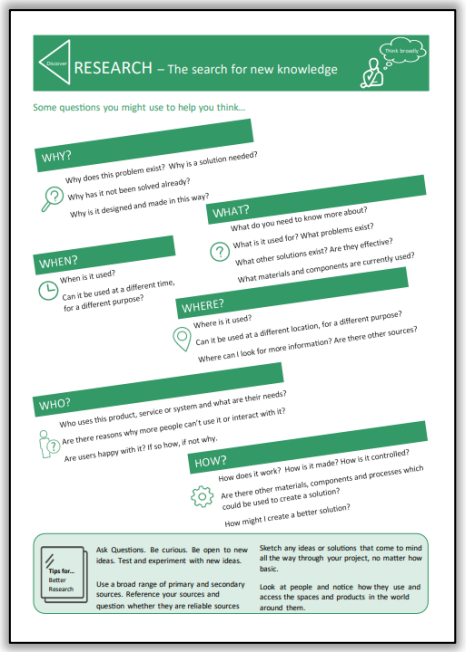


They are developed by the teacher and/or the student and describe what success looks like.

They help the teacher and student to make judgements about the quality of student learning

NCCA, Focus on Learning, Workshop 01, page 5

Questions from My Design Guide to aid research

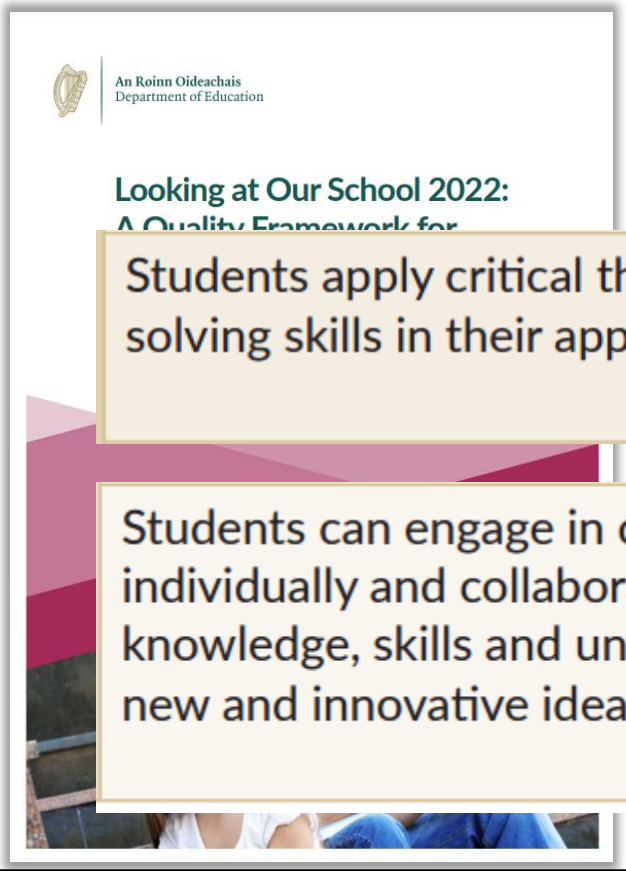


- What do you need to know more about?
- Who uses this product, service, or system and what are their needs?
- Why is a solution needed?
- When is it used?
- Where is it used?
- How does it work?
- What other solutions exist?
- How is it controlled?

Group Feedback & Discussion

How do you know that you have successfully completed the design activity?

Looking at Our School 2022



Dimension 1: Learning and Teaching
Domain 1: Learner outcomes

Students have	Students demonstrate a knowledge, appropriate	Students demonstrate a knowledge, appropriate to
	Students apply critical thinking and problem-solving skills in their approach to their learning.	Students apply critical thinking and problem-solving skills in their approach to their learning **and develop as autonomous learners.**
relationships		to do so themselves.
	Students can engage in creative processes individually and collaboratively that develop their knowledge, skills and understanding and result in new and innovative ideas and solutions.	Students can engage in creative processes individually and collaboratively that **transform** their knowledge, skills and understanding resulting in new and innovative ideas and solutions **that have value in real world applications.**

How do these LAOS statements align with the activities associated with this Unit of Learning?

In this session, we…

Explored creativity and problem-solving skills through the lens of the fundamentals of electronics

Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE 2024/2025

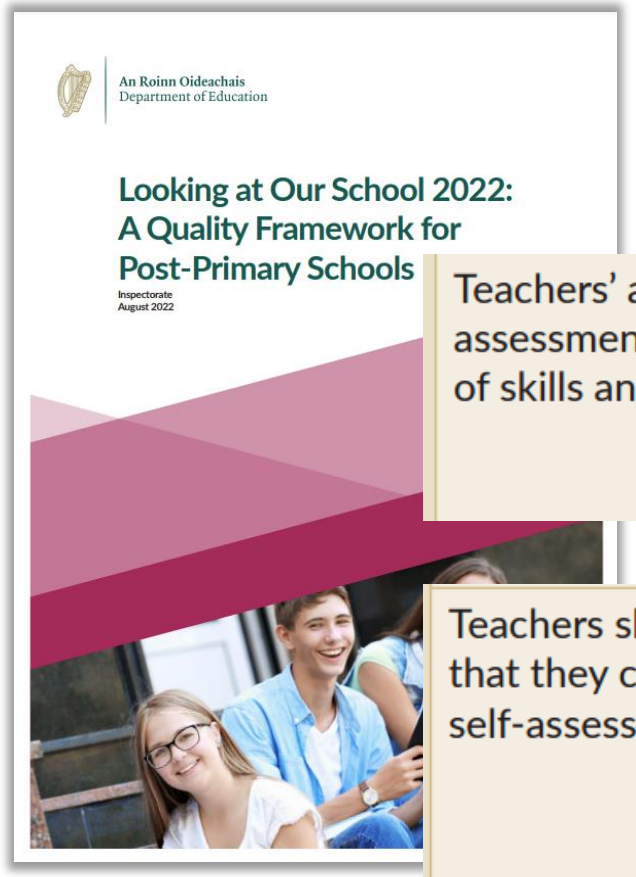
Session 3

CC BY NC

In this session, we will…

Consider how the use of success criteria can be used in the self-assessment of skills which will aid students in reflecting on their learning journey.

Looking at Our School 2022



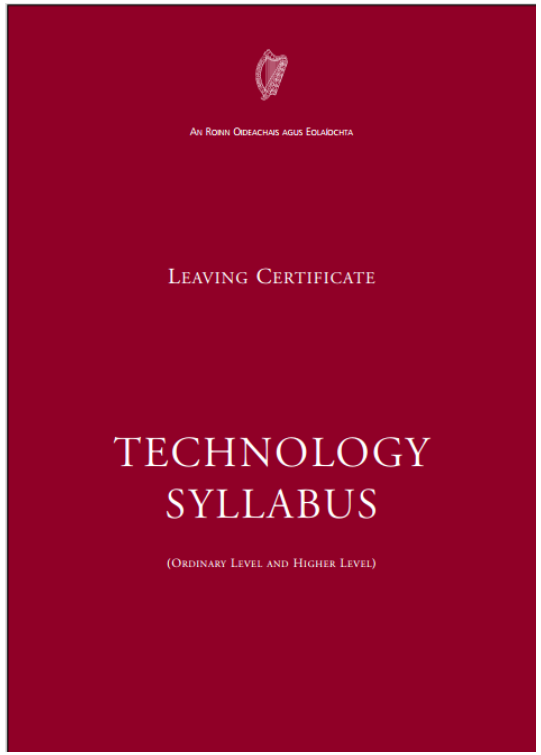
Dimension 1: Learning and Teaching
Domain 3: Teachers' individual practice

Standards	Statements of effective practice	Statements of highly effective practice
	Teachers' assessment practices include not only assessment of knowledge but also assessment of skills and dispositions.	Teachers' assessment practices include not only assessment of knowledge but also assessment of skills and dispositions. **Teachers tailor assessment strategies to meet individual learning needs.**
	Teachers share success criteria with students so that they can assess their own learning through self-assessment and peer assessment.	Teachers share **and co-create** success criteria with students so that they can assess their own learning through self-assessment and peer assessment, and **identify areas for improvement and strategies to achieve improvement.**
	clear, useful and easy to interpret and share.	clear, useful, easy to interpret and share, **and are tailored to students' individual learning needs.**

Leaving Certificate Technology Syllabus

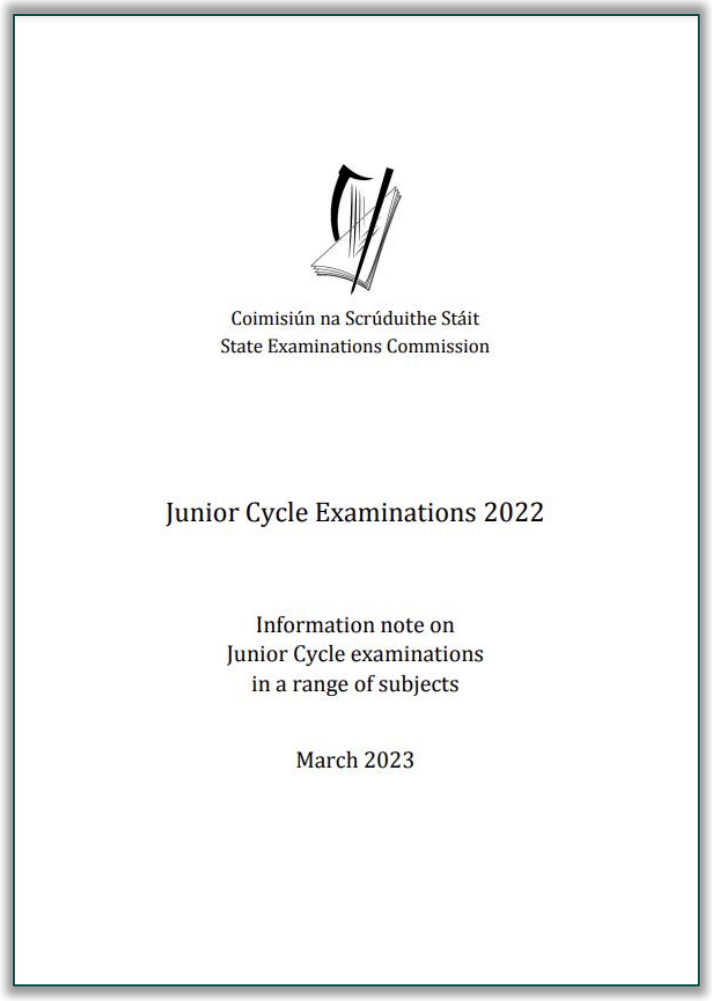
- *be able to evaluate a completed artefact or system against its original specification, propose alterations and modifications at the design, implementation or completion stages to enhance its appearance or function*

NCCA, Leaving Certificate Technology Syllabus, page 6.



www.curriculumonline.ie

SEC Information Note


Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Cycle Examinations 2022

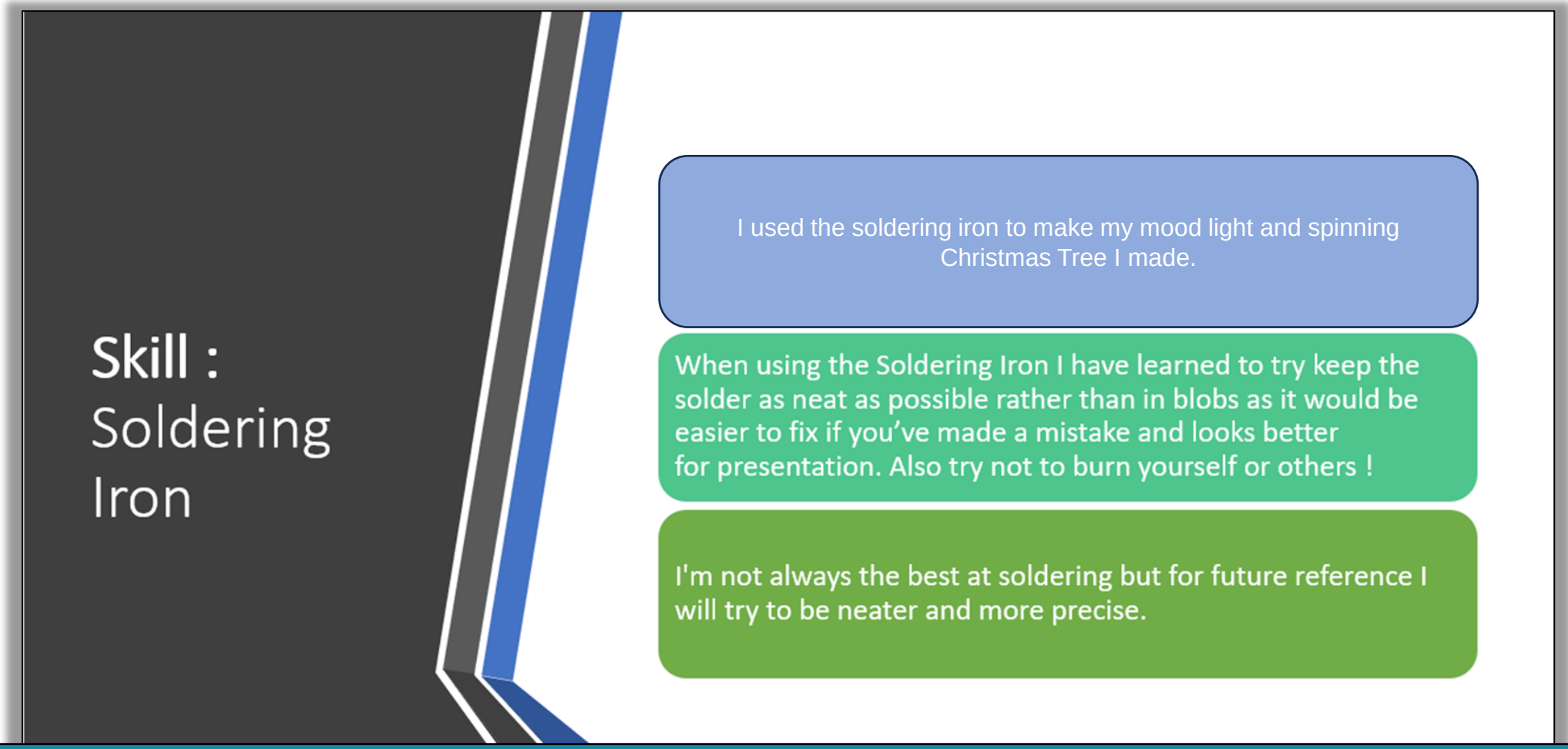
Information note on
Junior Cycle examinations
in a range of subjects

March 2023

Candidates should demonstrate a high level of technological competence in the range and depth of skills used in the manufacture of each part.

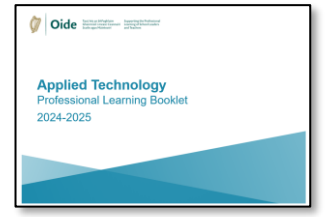
SEC, Information note on Junior Cycle examinations in a range of subjects, page 41.

Student Self-Analysis and Evaluation

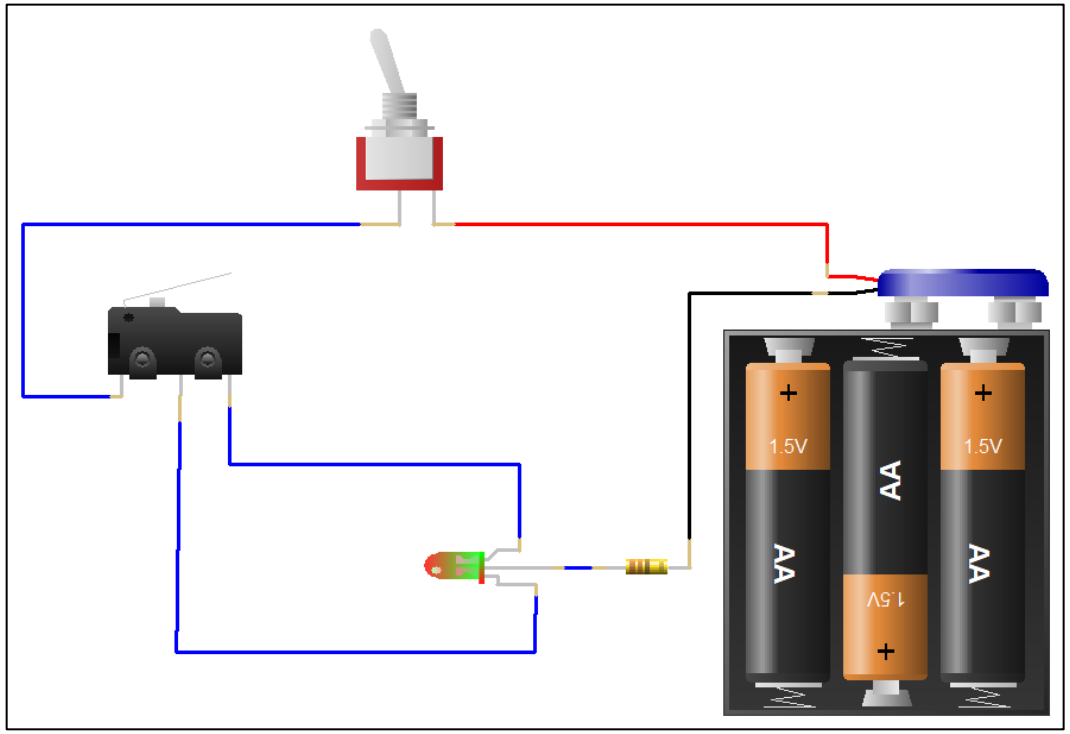


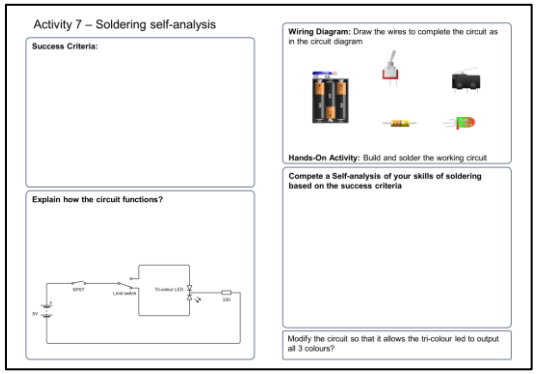
How could the co-construction of success criteria enable the student to conduct a more in-depth analysis of their skill of soldering?

Enacting the Learning



Devise success criteria, solder and test the following circuit, and evaluate the activity:





Success criteria for a soldering task

Prompts:

- Safety
- Preparation
- Materials Used
- Technique

Activity 7 – Soldering self-analysis

Oide

Success Criteria:

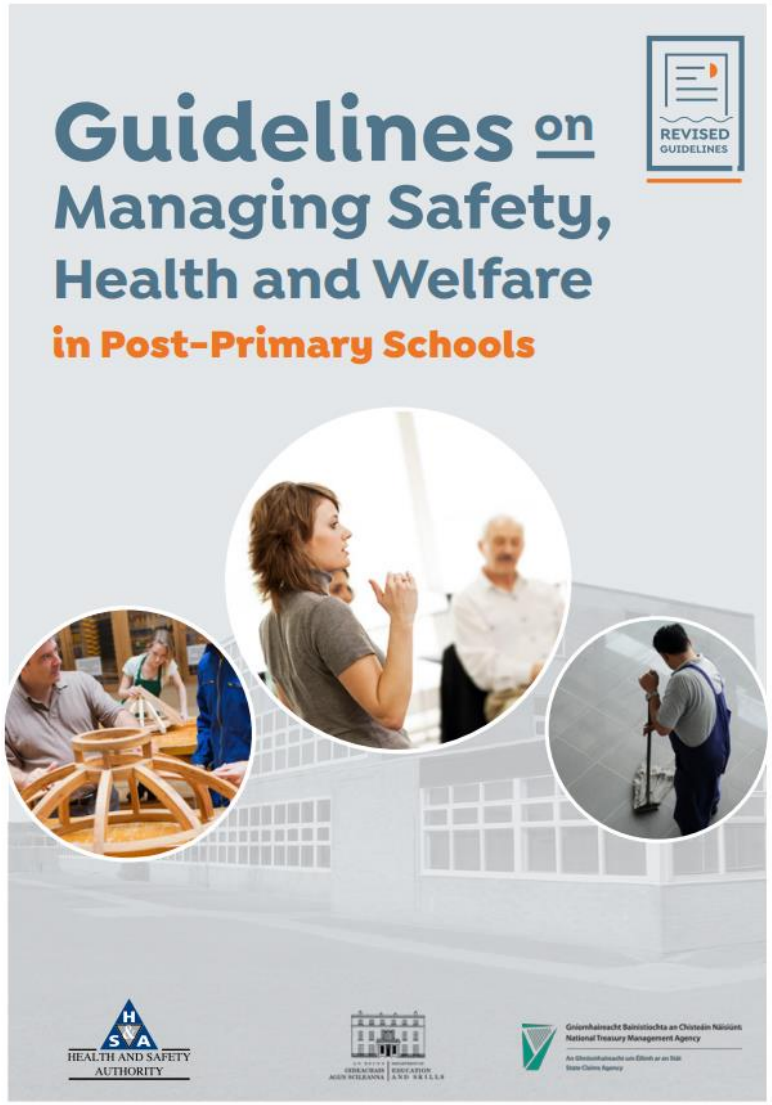
Produced safely

Preparation

Materials used

Correct soldering technique

Health and Safety Check-in Moment



Hazard:

'A hazard is anything that has the potential to cause harm to people.'

Risk:

'Risk is the likelihood that someone will be harmed by the hazard together with the severity of harm suffered.'

Control measure/Control:

'Control measures/control are the precautions taken to ensure that the risk is eliminated or reduced'

HSA, Guidelines on Managing Safety, Health and Welfare in Post-Primary Schools, page14.

Health and Safety Check-in Moment:

Health and Safety Check-in Moment

Item / Activity:		
Hazard(s): A hazard is anything that has the potential to cause harm.	**Risk(s):** Risk is the harm that can be caused by the hazard.	**Control Measures:** Control measures are the precautions taken to ensure that the risk is eliminated or reduced.

Hazard

Identify the hazard

Risk

What harm could the hazard cause?

5 Minutes

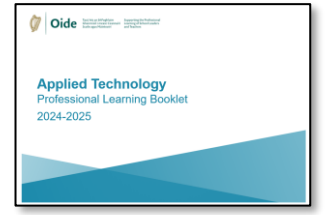
Control Measures

What control measures or precautions should be taken to ensure that the risk is eliminated or reduced?

Risk Assessment

Hazard(s): A hazard is anything that has the potential to cause harm.	**Risk(s):** Risk is the harm that can be caused by the hazard.	**Control Measures:** Control measures are the precautions taken to ensure that the risk is eliminated or reduced.
Burns	Contact between skin and hot soldering iron	Demonstration of correct soldering technique in advance of teachers using the soldering iron. Availability of first aid materials
Electrical short	Soldering iron coming in contact with power lead and melting through it causing an electrical short	Check for damaged lead before use. Use soldering irons with silicone leads that won't melt if available. Discussion with teachers about the hazard Supply soldering iron stand to hold the soldering iron when not in use.
Hazardous Fume inhalation	Inhaling soldering fumes while soldering	Use provided fume extractor Provide unleaded solder to minimise harmful fumes
Damage to desks	Soldering iron coming in contact with the desk when soldering, causing burn damage	Use supplied silicone mats when soldering to protect the desk

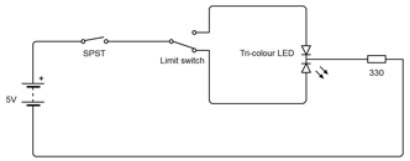
Activity 7 - Self-analysis of soldering skills based on success criteria



Activity 7 – Soldering self-analysis

Success Criteria:

Explain how the circuit functions?



Wiring Diagram: Draw the wires to complete the circuit as in the circuit diagram

Hands-on activity: Build and solder the working circuit

Record your soldering experience based on the success criteria

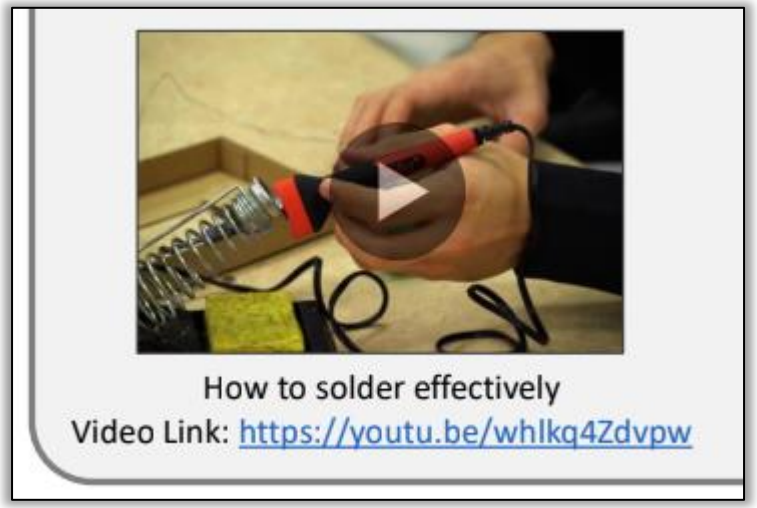
Safety	Preparation
Materials used	**Technique(s)**

Could you modify the circuit so that it allows the tri-colour led to output all 3 colours?

What will you do differently the next time you solder?

Existing resource on Scoilnet

- https://www.scoilnet.ie/uploads/resources/39126/38979.pdf



Group Feedback & Discussion

How could this approach support student engagement with CBA2: Student self-analysis and evaluation?

CBA2: Student self-analysis and evaluation

https://curriculumonline.ie/junior-cycle/junior-cycle-subjects/applied-technology/

Applied Technology

The Guidelines for the Classroom-Based Assessments in Applied Technology have been updated and are available under the '*Assessment Guidelines*' tab.

Under the current Framework for Junior Cycle, students have access to a suite of technology subjects: Engineering, Wood Technology, Graphics and Applied Technology

Junior Cycle Applied Technology aims to develop the students' curiosity of the technological world while integrating the necessary subject knowledge with the disciplinary skills to investigate and solve real-life problems.

View Specification PDF

Click on graphic below

Curriculum Specification

Assessment Guidelines

Examples of Student Work

CBA Revised Arrangements

In this session, we…

- Considered how the use of success criteria can be used in the self-assessment of skills which will aid students in reflecting on their learning journey.

Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

Applied Technology

PLE 2024/2025

Thank you for your participation in today's PLE

CC BY NC