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Supporting the Professional Learning of School Leaders and Teachers

Construction Technology

Cluster PLE

2025/2026

Construction Technology Support Team

Oide

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Senior Leader

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Share

5 minutes

Your school context?

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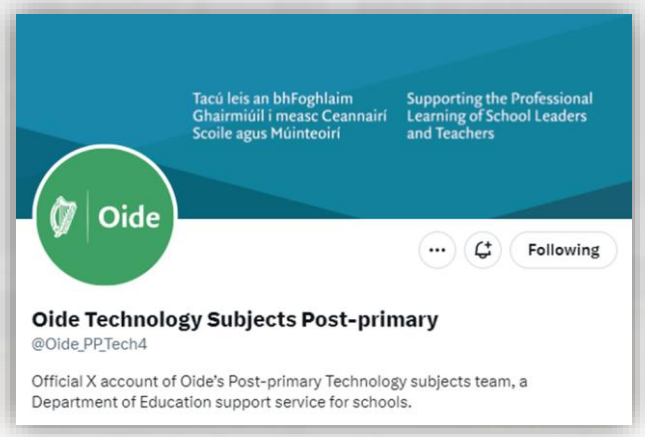
www.oide.ie

info@oide.ie



@Oide_PP_Tech4

Join the mailing list

Looking forward, we will…

Explore the structure of the Construction Technology specification.

Develop a shared understanding of the Rationale and Aims of the Construction Technology specification.

Explore the contextual strands of learning in Construction Technology.

Investigate the Learning Outcomes sections with a particular focus on the Action Verbs.

Experience a Unit of Learning that integrates the strands of the Construction Technology specification.

Develop learning experiences that promote an integrated approach.

Setting the Scene….

1983

Present Day

1983
Construction Studies Syllabus

March – May 2024
Construction Studies Background Paper & Consultation

February- May 2025
Draft Construction Technology Specification & Consultation

September 2025
Construction Technology Specification Published

September 2026
Construction Technology Introduced in Schools

Supports in 2025/2026

Oide

Webinar

Collaboratives

PLE

Electives

01

One full-day PLE workshop per academic year

02

An evening webinar will explore teaching and learning from the specification

03

Oide will facilitate collaborative events in 2025/2026

04

A wide range of in-person and online elective events will be provided

Construction Technology Timeline

Oide

Construction Technology

Specification finalised and approved by the Minister

September 2025

AAC Guidelines

Additional Assessment Components Guidelines, NCCA

November 2025

Sample Papers

Two sample papers at higher and ordinary level. Sample craft skills assessment.

April 2026

Introduction to Schools

Introduction of Construction Technology in schools

1 Sample AAC 1 Brief

September 2026

AAC 1

Exploring the Constructed Environment. Common Brief SEC

AAC 2

The Craft Skills Assessment Common Prescribed Task SEC

April/May 2028

Written Examination

Written Examination Higher & Ordinary Levels SEC

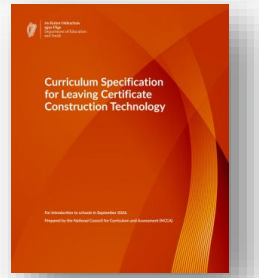
June 2028

Assessment for Certification

Assessment Component	Weighting	Level
Exploring the Constructed Environment	**30%**	**Common Brief**
Craft Skills Assessment	**20%**	**Common Prescribed Task**
Written Examination	**50%**	**Higher and Ordinary Levels**

"It is envisaged that the AAC will take up to 3 hours to complete." NCCA, Leaving Certificate Construction Technology Specification, page 29.

"It is envisaged that the AAC will take up to 35 hours to complete." NCCA, Leaving Certificate Construction Technology Specification, page 27.

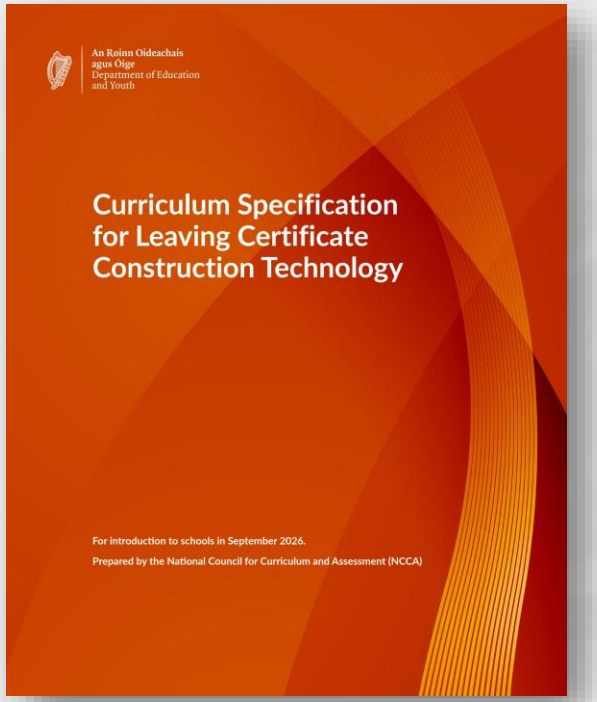


"The learning experience at both Ordinary and Higher levels will be tailored to support students in developing their knowledge and skills at an appropriate depth and complexity." NCCA, Leaving Certificate Construction Technology Specification, page 12.

Open discussion

QR Code to Specification

https://www.curriculumonline.ie/senior-cycle/senior-cycle-subjects/construction-studies/



SCAN ME!

Pg. 15

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Supporting the Professional Learning of School Leaders and Teachers

Session 1

Explore the structure of the Construction Technology specification

Develop a shared understanding of the Rationale and Aims of the Construction Technology specification

Construction Technology Rationale

- Watch the Introduction Video.
- Write 1-2 phrases or ideas that resonate with you or spark a question.
- What are the key messages contained in the video?

Pg. 2

Construction Technology Rationale

Oide

Rationale

Leaving Certificate Construction Technology fosters a holistic understanding of the built environment, providing opportunities for students to develop confidence to navigate local and global challenges and contribute to a sustainable future. It cultivates an appreciation for architectural heritage while promoting innovation, craft excellence, and environmentally responsible design. Students explore the interconnectedness of architectural design, construction techniques, planning and environmental considerations, developing an awareness for their impact on our natural and built environment, society, individual behaviours, and the economy.

Leaving Certificate Construction Technology instils a sense of environmental responsibility in students, encouraging ethical decision-making, sustainable building and craft practices, and a strong emphasis on design. By integrating learning about STEM concepts, such as inquiry and problem-solving, students deepen their understanding of material properties, energy efficiency, and sustainable construction principles. This enables them to make informed decisions regarding materials, construction methods, and environmental conservation.

The Leaving Certificate Construction Technology classroom is an active learning environment where students integrate theory with practice and foster technological literacy and capability through a wide range of learning experiences. This hands-on approach nurtures critical thinking, problem-solving, creativity, craft skills, and communication abilities, empowering students to tackle construction challenges and shape a sustainable future.

Beyond the classroom, the subject prepares students for a range of diverse futures, including apprenticeships, further and higher education, and STEM-related professions. Through a balanced curriculum that integrates traditional craft and heritage skills with modern technologies, it fosters adaptability and life-long learning, ensuring students are equipped for evolving professional landscapes and active citizenship.

Activity 1

In Groups

- One paragraph each.
- Discuss the phrases, ideas, key terms, and concepts you identified.

Explore the Rationale

Pg. 2

- Core Values
- Teaching & Learning

5 minutes

NCCA, Leaving Certificate Construction Technology Specification, page 4.

Construction Technology Aims

Oide

Activity 2

Aims

The aim of Leaving Certificate Construction Technology is to provide students with an experience that develops their interest in and enthusiasm for learning relating to the built environment. It aims to equip students to become technologically literate and responsible citizens, in ethical and sustainable ways, who will embrace life-long learning and sustainable living and be prepared for local and global challenges and opportunities.

More specifically, Leaving Certificate Construction Technology enables students to:

- learn about the relevant core concepts and fundamental principles of construction
- develop a holistic understanding of the built environment by enhancing visual literacy, promoting environmentally responsible design, recognising its impact on societal wellbeing, and drawing insights from both the past and present
- enhance their technological literacy and capability, by applying the necessary knowledge, skills, values, and dispositions to design, innovate and develop creative solutions that address challenges within the built environment
- develop an awareness of future pathways and opportunities through the learning experiences offered in Construction Technology.

In Groups

- Introduction + one aim each.
- Having discussed the aims, what knowledge, skills, and values should a Construction Technology student develop?
- How can the aims guide teaching?
- Each group present their thoughts on the Rationale & Aims

NCCA, Leaving Certificate Construction Technology Specification, page 5.

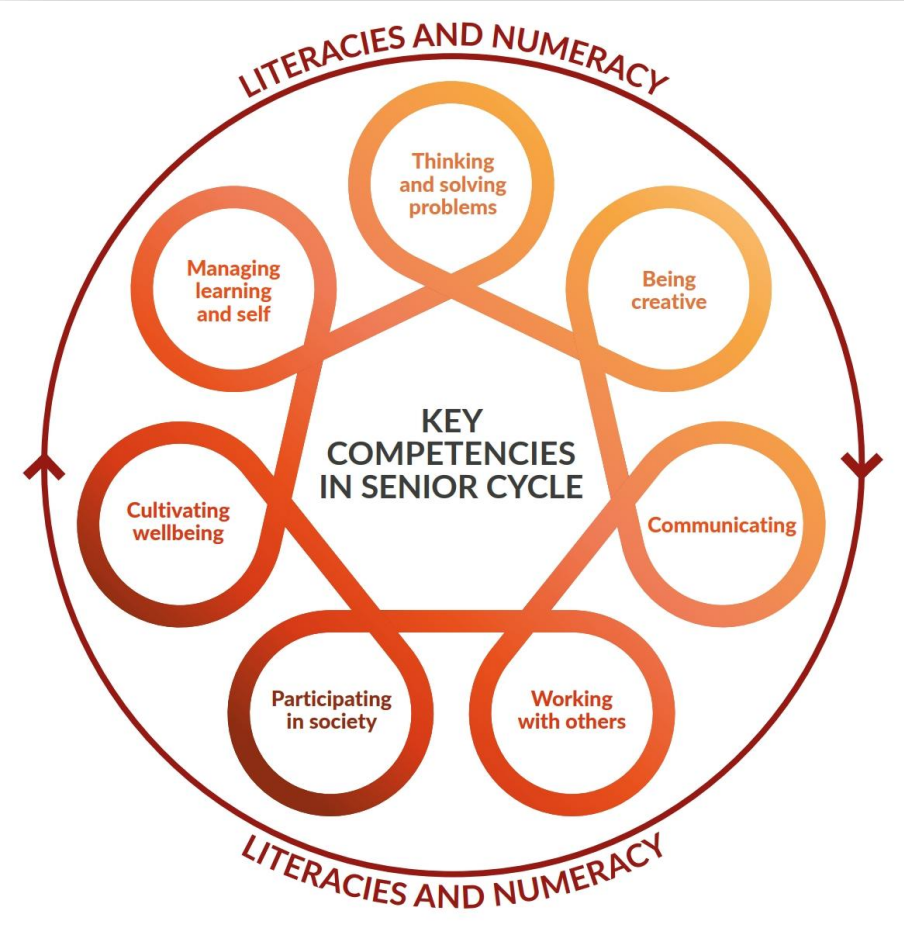
Explore the Aims

Pg. 3

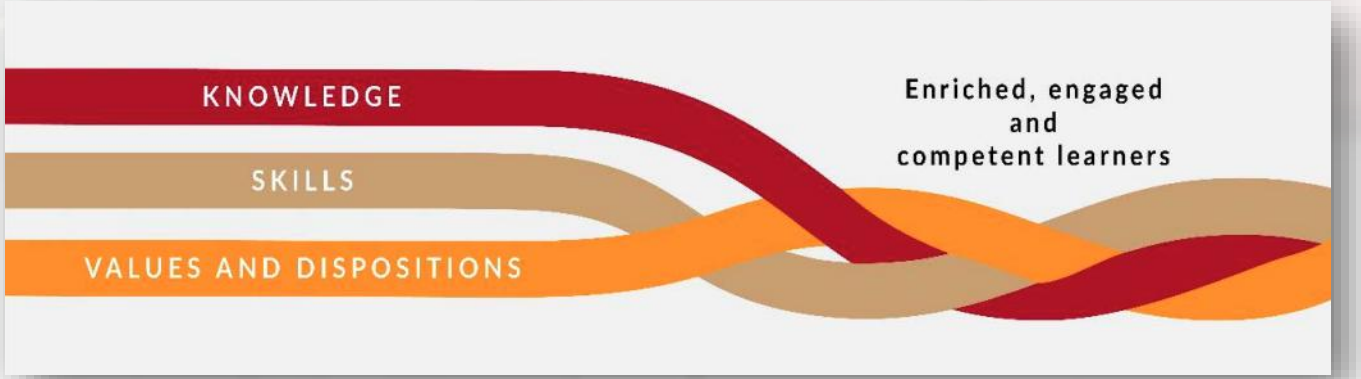
Share

10 minutes

Key Competencies – Senior Cycle



How can Construction Technology contribute to the development of the Key Competencies?



NCCA, Leaving Certificate Construction Technology Specification, pages 8, 9.

Teaching for student learning

Oide

Teaching for student learning

Teaching for student learning in Construction Technology emphasises active and problem-based learning, enabling students to apply theoretical knowledge to local and global situations. A pedagogical approach grounded in hands-on learning actively engages students through direct interaction with materials, tools, or environments related to the subject matter. This engagement can occur in various settings, such as the classroom, at home, or out of school settings. Students connect new experiences to prior knowledge through active participation in tasks or projects.

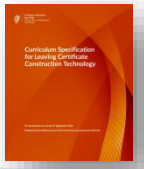
NCCA, Leaving Certificate Construction Technology Specification, page 24.

Assessment in Construction Technology

Oide

What could assessment in the Construction Technology classroom look like?

- *"Differentiation"*
- *"Project-Based Assessments"*
- *"Varied Assessment Strategies"*
- *"Development of Student Key Competencies"*
- *"Promotes Progression"*
- *"Promotes Learner Autonomy"*
- *"Identify Next Steps"*
- *"Feedback"*



NCCA, Leaving Certificate Construction Technology Specification, pages 25, 26.

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Supporting the Professional Learning of School Leaders and Teachers

Session 2

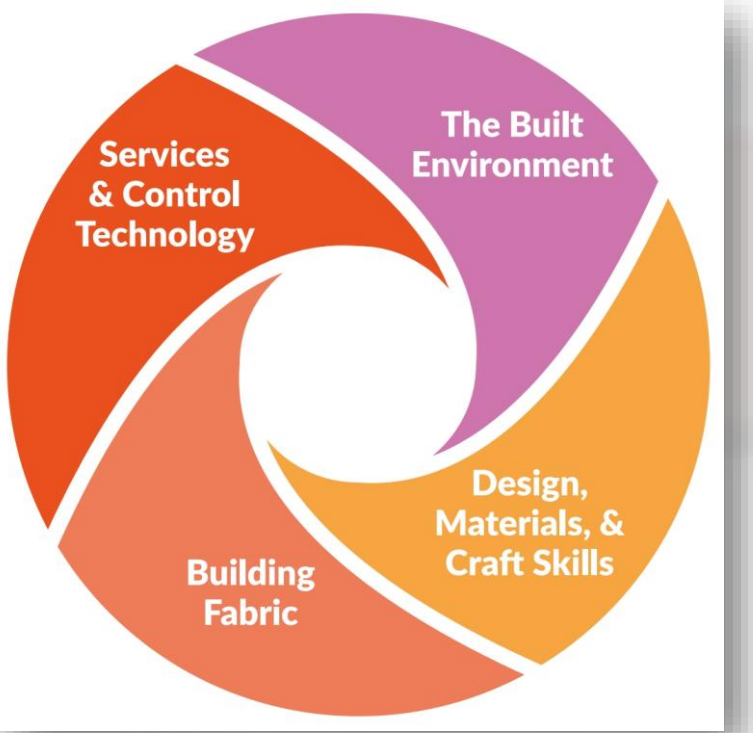
Explore the contextual strands of learning in Construction Technology.

Investigate the Learning Outcomes sections with a particular focus on the Action Verbs.

Strands of Study

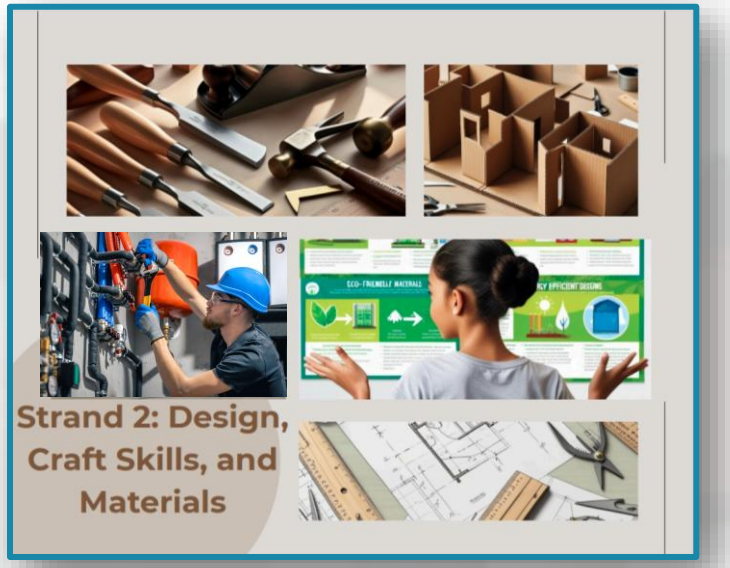
The Leaving Certificate Construction Technology specification sets out the knowledge, skills, values and dispositions for students in four strands:

1. The Built Environment
2. Design, Materials, and Craft Skills
3. Building Fabric
4. Services and Control Technology.



NCCA, Leaving Certificate Construction Technology Specification, page 11.

Construction Technology Strands



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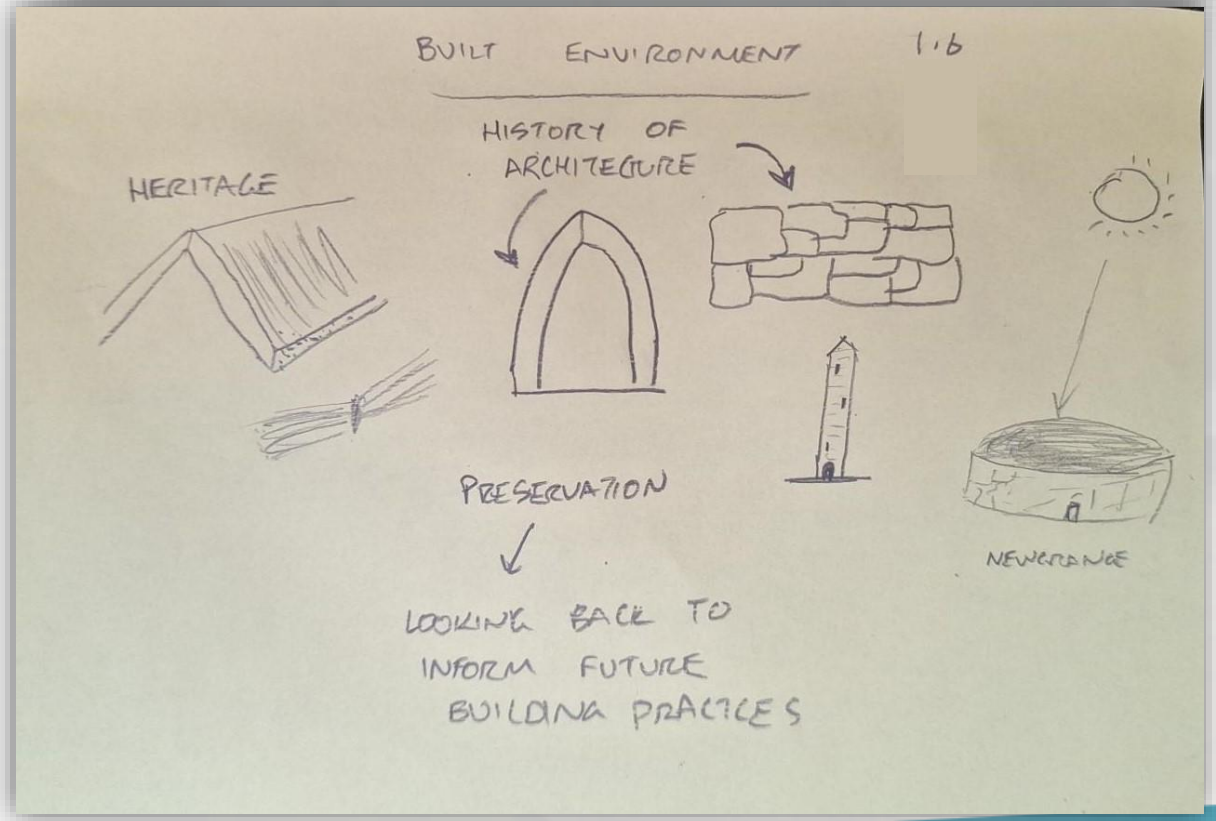
Supporting the Professional Learning of School Leaders and Teachers

Construction Technology Strands

Students learn about	Students should be able to
Environmental and architectural heritage of dwellings • historical and cultural significance • vernacular, and ecological significance of heritage sites and structures • value to communities and society • informing future building practices	1.5 recognise the importance of architectural and built heritage in influencing a contemporary built environment. 1.6 justify the preservation and sustainable management of environmental and built heritage.



Activity 3

1. Read through the areas of learning from the "Strand of Study" you have been assigned.
2. Using an A5 post-it note, create a graphical representation that illustrates the area of learning.
3. Stick your illustration to the flipchart page
4. Reflection - Ghost Walk

Activity 3

Pg.4-11

Explore the Strands

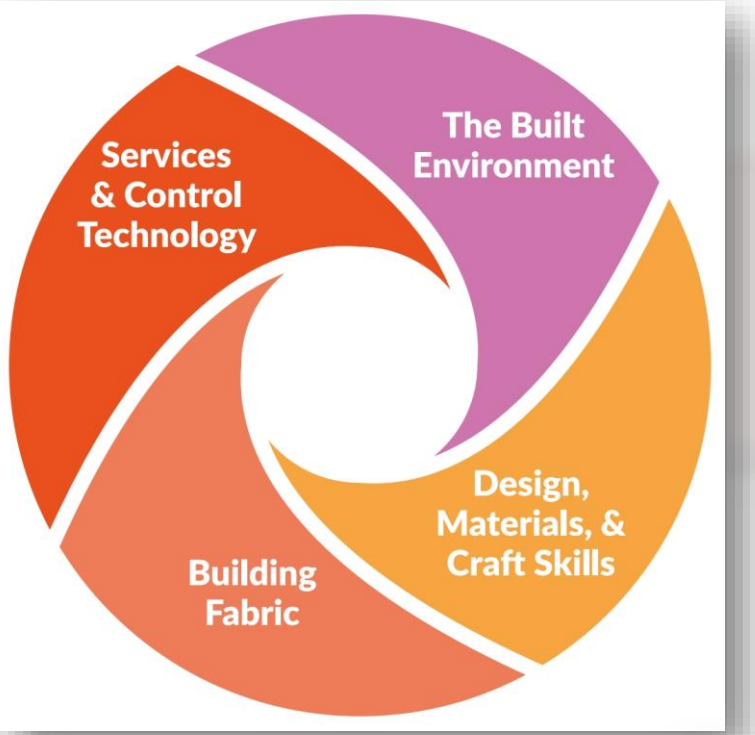
10 minutes

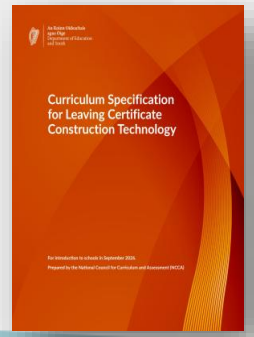
A5 Post-its

Strands of Study

The Leaving Certificate Construction Technology specification sets out the knowledge, skills, values and dispositions for students in four strands:

1. The Built Environment
2. Design, Materials, and Craft Skills
3. Building Fabric
4. Services and Control Technology.





"The specification emphasises a non-linear, integrated approach to learning across the strands."
NCCA, Leaving Certificate Construction Technology Specification, page 12.

NCCA, Leaving Certificate Construction Technology Specification, page 11.

Structure of Strands of Study

Strand 1: Built Environment

In the Built Environment, students learn to appreciate the importance of sustainability in the construction of buildings and the need for sustainable housing and a sustainable planet. Students understand that, by making informed ethical choices regarding the built environment, they have agency to change the world for the better.

Students learn about the evolution of building types over time and understand buildings in a holistic manner - not as stand-alone structures but as structures closely connected to their site, society, climate patterns, region, country and the planet. Students appreciate how housing impacts the shaping of community identity, environmental sustainability and social cohesion.

As students work independently and with others, they appreciate the crucial importance of health and safety when working with tools and machinery, for their own personal safety and for the safety of others.

Students appreciate the importance of the conservation of heritage sites and structures and how design challenges were resolved by previous generations through the use of locally sourced materials and skills. Students learn how Universal Design principles inform inclusive design and ease-of-use of modern buildings.

Strand 1 Learning outcomes

Students learn about	Students should be able to
Design principles of a domestic dwelling for the built environment • building/structural design • building form • function • aesthetics • balance • proportion • harmony • innovation • orientation • sustainability • environmental impact • accessibility	1.1 describe the natural and built environment emphasising the critical role of shelter and settlement in human existence and its impact on the environment. 1.2 analyse elements of architectural design in the built environment. 1.3 evaluate features that contribute to design excellence in housing design. 1.4 justify measures for the preservation and sustainable management of buildings.

Narrative Overview

Learning outcomes

- Students learn about
- Students should be able to

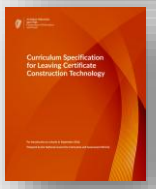
NCCA, Leaving Certificate Construction Technology Specification, page 14.

Action Verbs

Students learn about	Students should be able to
Design principles of a domestic dwelling for the built environment • building/structural design • building form • function • aesthetics • balance • proportion • harmony • innovation • orientation • sustainability • environmental impact • accessibility	1.1 describe the natural and built environment emphasising the critical role of shelter and settlement in human existence and its impact on the environment. 1.2 analyse elements of architectural design in the built environment. 1.3 evaluate features that contribute to design excellence in housing design. 1.4 justify measures for the preservation and sustainable management of buildings.

Pg. 13

Action verb	Students should be able to
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



NCCA, Leaving Certificate Construction Technology Specification, page 14.

NCCA, Leaving Certificate Construction Technology Specification, page 33.

Engaging with Action Verbs

- Examine the selected LO

Students learn about	Students should be able to
Drainage systems for a domestic dwelling • above ground pipework layout • single stack system • below ground pipework layout …ite treatment systems	4.22 identify the design principles of drainage systems, distinguishing between surface water drainage and foul water drainage. 4.23 illustrate the pipework layout of drainage systems for a domestic dwelling. 4.24 explain the components and functions of on-site wastewater treatment systems for a domestic dwelling. 4.25 evaluate how wastewater treatment methods, contribute to effective waste management, water conservation and reuse, and environmental sustainability.

4.22 identify the design principles of drainage systems, distinguishing between surface water drainage and foul water drainage.

4.23 illustrate the pipework layout of drainage systems for a domestic dwelling.

4.24 explain the components and functions of on-site wastewater treatment systems for a domestic dwelling.

4.25 evaluate how wastewater treatment methods, contribute to effective waste management, water conservation and reuse, and environmental sustainability.

5 minutes

Pg. 12

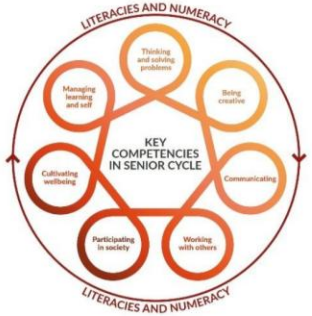
NCCA, Leaving Certificate Construction Technology Specification, page 23.

How do the action verbs in the Learning Outcomes influence the learning experience?

Activity 4

Pg.12

5 minutes



Students learn about	Students should be able to

Drainage systems for a domestic dwelling
• above ground pipework layout
  ◦ single stack system
• below ground pipework layout
  ◦ onsite treatment systems
	4.22 identify the design principles of drainage systems, distinguishing between surface water drainage and foul water drainage.
	4.23 illustrate the pipework layout of drainage systems for a domestic dwelling.
	4.24 explain the components and functions of on-site wastewater treatment systems for a domestic dwelling.
	4.25 evaluate how wastewater treatment methods, contribute to effective waste management, water conservation and reuse, and environmental sustainability.

Knowledge

Skills

Values & Dispositions

Action Verb(s)	
What does the action verb imply? (Glossary)	
What does this verb look like in action within this learning outcome, and how could we bring it to life for students through practical examples?	
How do you capture the learning and assess it?	

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Supporting the Professional Learning of School Leaders and Teachers

Session 3

Experience a Unit of Learning that integrates the strands of the Construction Technology specification.

Develop learning experiences that promote an integrated approach.

Construction Technology Strands

Where could we begin when creating a Unit of Learning?

Interconnecting the Strands

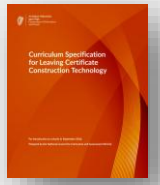
Where could we begin?

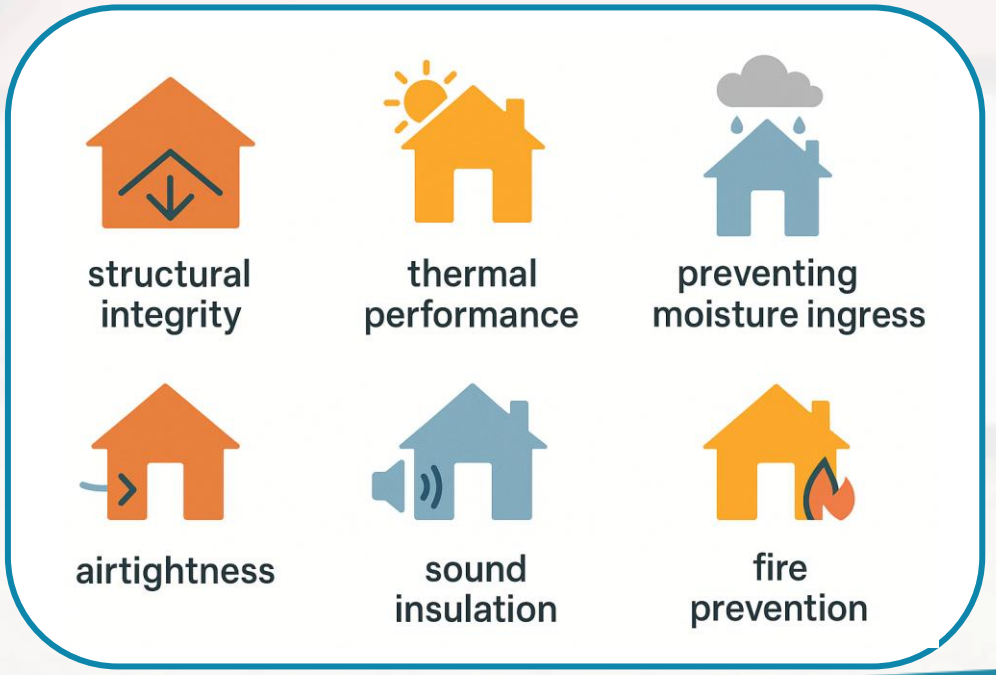
Construction principles for a domestic dwelling

Strand 3 Learning outcomes

Students learn about	Students should be able to
Construction principles for a domestic dwelling • structural integrity • thermal performance • preventing moisture ingress • airtightness • water vapour control • ventilation • sound insulation • fire prevention	3.1 analyse the important principles in the design of the building fabric. 3.2 apply knowledge of building design principles to construction elements. 3.3 recognise how building design principles are integrated into the construction detailing of a domestic house. 3.4 describe methods of retrofitting the building fabric to improve the quality and function of existing dwellings.

NCCA, Leaving Certificate Construction Technology Specification, page 18.





Interconnecting the Strands

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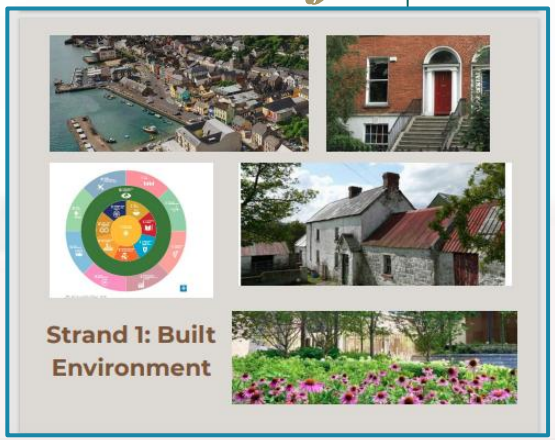
Students learn about	Students should be able to
Design principles of a domestic dwelling for the built environment • building/structural design • building form • function • aesthetics • balance • proportion • harmony • innovation • orientation • sustainability • environmental impact • accessibility	1.1 describe the natural and built environment emphasising the critical role of shelter and settlement in human existence and its impact on the environment. 1.2 analyse elements of architectural design in the built environment. 1.3 evaluate features that contribute to design excellence in housing design. 1.4 justify measures for the preservation and sustainable management of buildings.



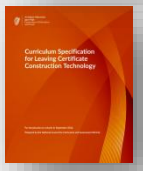
NCCA, Leaving Certificate Construction Technology Specification, page 14.

Personal safety and Safety on a Construction Site • hazards • risks • control measures	1.10. describe current health and safety regulations in a Construction Technology classroom and on construction sites. 1.11. apply risk management strategies to a range of activities in both a Construction Technology classroom and in a construction environment. 1.12. apply current health and safety protocols including the appropriate use of Personal Protection Equipment. 1.13. collaborate with others in maintaining a safe working environment.

NCCA, Leaving Certificate Construction Technology Specification, page 15.

Interconnecting the Strands

Students learn about	Students should be able to
Communication skills	2.17 present their work in a clear, organised, and aesthetically engaging manner.
	2.18 use a variety of presentation techniques and technologies to communicate ideas, thinking, and technical information to complete tasks.
Personal reflection	2.19 evaluate their own learning to inform future decisions and choices.



NCCA, Leaving Certificate Construction Technology Specification, page 17.

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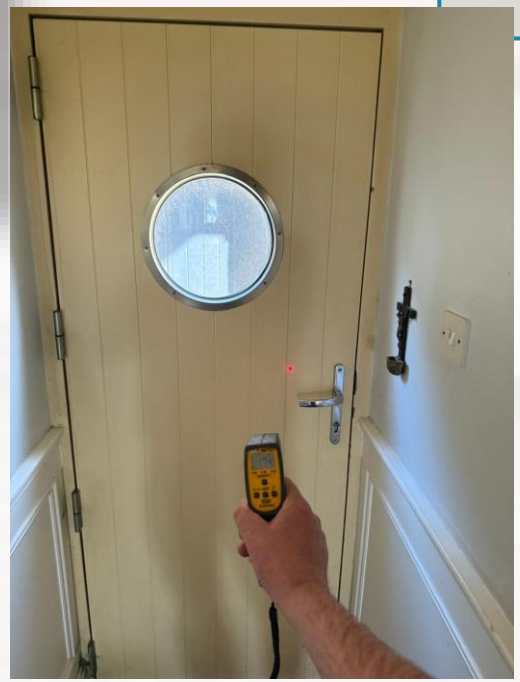
Supporting the Professional Learning of School Leaders and Teachers

Interconnecting the Strands

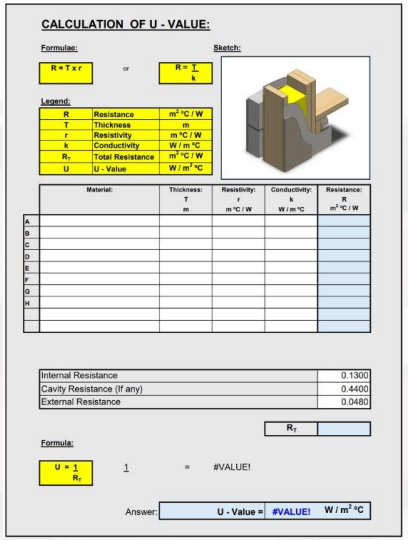
Students learn about	Students should be able to
Functions of the building fabric in a domestic dwelling • protection from the weather • thermal performance • structural support and stability • moisture control and ventilation • acoustic performance • aesthetic value and design • fire safety • durability and maintenance • sustainability and environmental impact	3.5 identify elements of building fabric and their function in a domestic dwelling. 3.6 analyse the design detailing within the building fabric.

NCCA, Leaving Certificate Construction Technology Specification, page 18.



Interconnecting the Strands

Students learn about	Students should be able to
Heat energy and scientific calculations in dwellings • Heat energy • heat transfer principles • Conduction • Convection • Radiation • thermal conductivity (λ̄) of construction materials • thermal resistance (R) of construction materials • thermal resistivity (r) • surface resistance • thermal transmittance calculations • U-value calculation • calculate energy loss and its cost in a building element	4.3 explain the principles of heat transfer. 4.4 describe how thermal properties impact the energy efficiency of a dwelling. 4.5 calculate U-value of domestic construction details and the rate, amount, and cost of energy loss in a dwelling. 4.6 describe measures used to enhance the energy efficiency of new and existing dwellings.
Airtightness in a domestic dwelling	4.8 explore airtightness standards, methods, materials and testing for a domestic dwelling. 4.9 describe detailing to reduce energy loss in a domestic dwelling.



NCCA, Leaving Certificate Construction Technology Specification, page 22.

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Construction Principles - Thermal Performance & Airtightness

Class group: 5th year students – Oct. 2026

Prior Learning:
Students may have completed Junior Cycle Wood Technology, Science, Graphics, Engineering or Applied Technology.

Focus of Learning:
Construction principles for a domestic dwelling
- Thermal Performance
- Airtightness

Students learn about:
Construction principles for a domestic dwelling
- thermal performance
- airtightness

Design principles of a domestic dwelling for the built environment
- sustainability
- environmental impact

Personal safety and Safety on a Construction Site
- hazards, risks, control measures

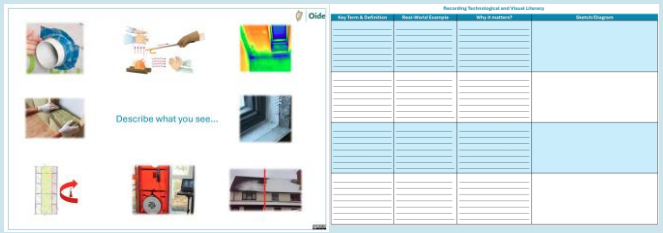
Personal reflection
- communication skills

Heat energy and scientific calculations in dwellings
- heat transfer principles
- U value calculations

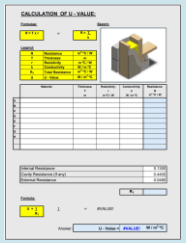
Airtightness in a domestic dwelling

Student's should be able to:
3.3 recognise how building design principles are integrated into the construction detailing of a domestic house
1.3 evaluate features that contribute to design excellence in housing design.
1.12. apply current health and safety protocols including the appropriate use of Personal Protection Equipment.
2.18 use a variety of presentation techniques and technologies to communicate ideas, thinking, and technical information to complete tasks.
3.1 analyse the important principles in the design of the building fabric.
3.5 identify elements of building fabric and their function in a domestic dwelling.
4.3 explain the principles of heat transfer.
4.4 describe how thermal properties impact the energy efficiency of a dwelling.
4.8 explore airtightness standards, methods, materials and testing for a domestic dwelling.
4.5 calculate U-value of domestic construction details and the rate, amount, and cost of energy loss in a dwelling.
4.6 describe measures used to enhance the energy efficiency of new and existing dwellings.
4.8 explore airtightness standards, methods, materials and testing for a domestic dwelling.

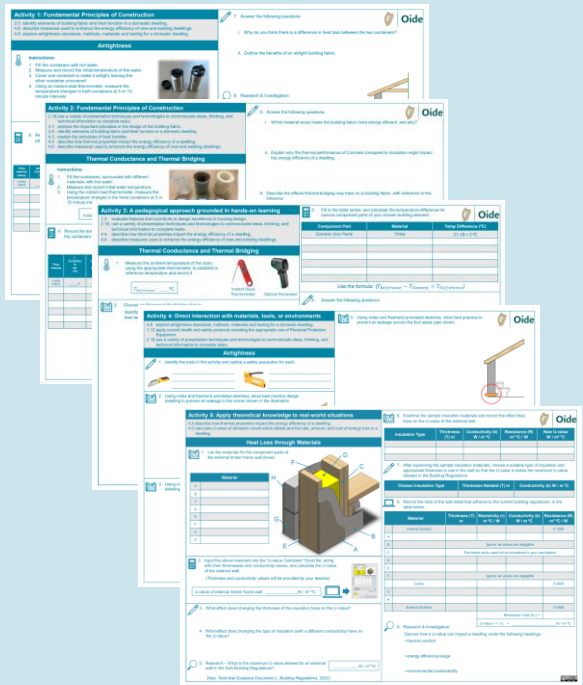
Evidence of Learning:



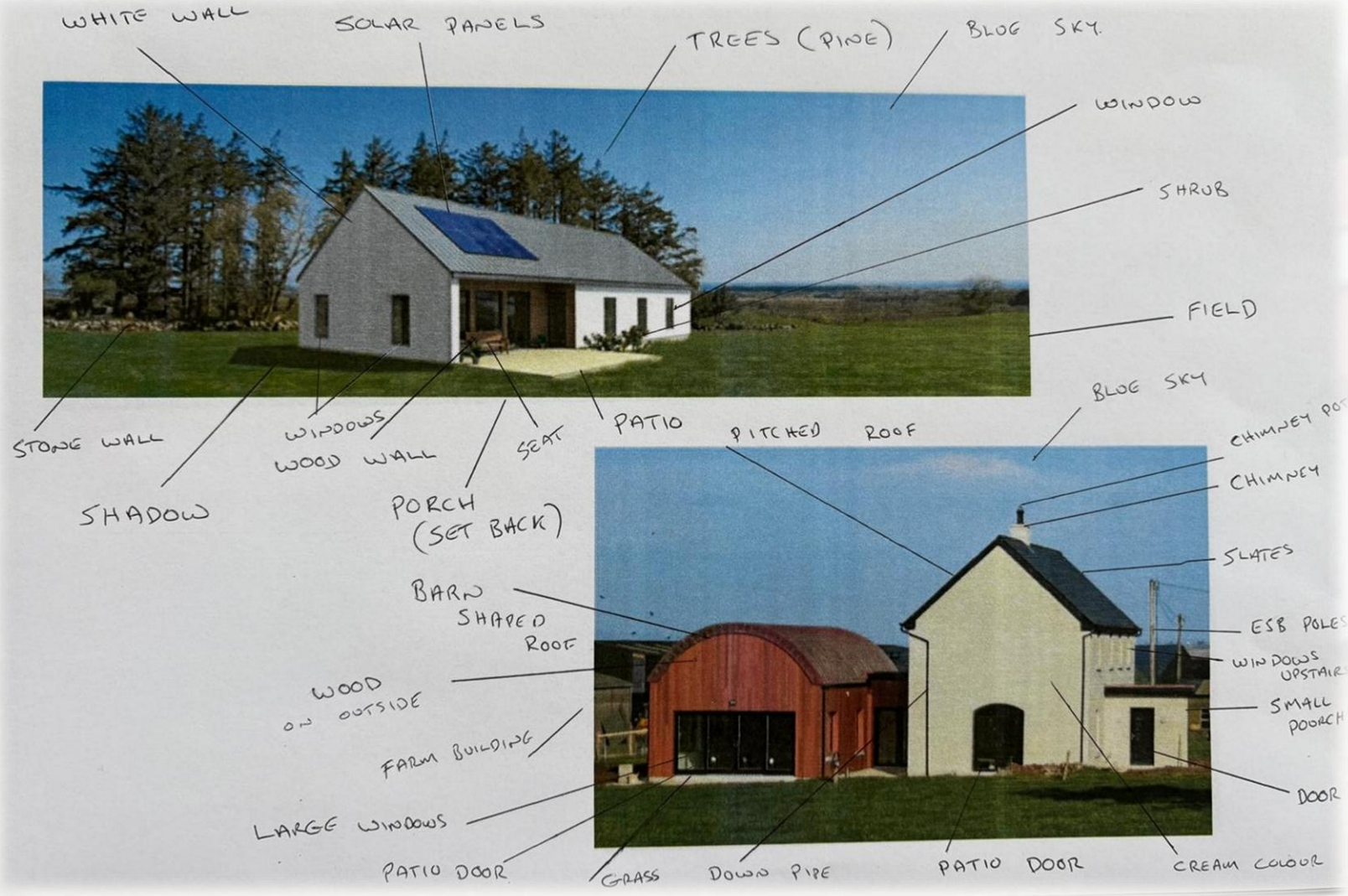
How can students experience the Key Learning?

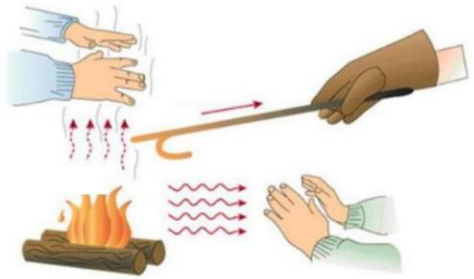


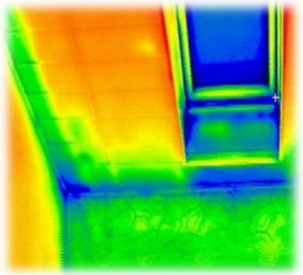
How can the Key Learning be assessed?



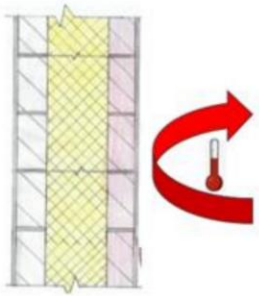
Example: Describe what you see







Describe what you see...



Teaching for student learning - Activities

Fundamental Principles of Construction

Activity 1
Airtightness

1. Fill the containers with hot water.
2. Measure and record the initial water temperature.
3. Cover one container to make it airtight, leaving the other container uncovered.
4. Using an instant-read thermometer, measure the temperature changes in both containers at 5 or 10-minute intervals.

Activity 2
Thermal Conductance and Thermal Bridging

1. Fill the containers, surrounded with different materials, with hot water.
2. Measure and record initial water temperature.
3. Using the instant-read thermometer, measure the temperature changes in the three containers at 5 or 10-minute intervals.

Teaching for student learning - Activity 1

Activity 1: Fundamental Principles of Construction

3.5 identify elements of building fabric and their function in a domestic dwelling.
4.6 describe measures used to enhance the energy efficiency of new and existing dwellings.
4.8 explore airtightness standards, methods, materials and testing for a domestic dwelling.

Airtightness

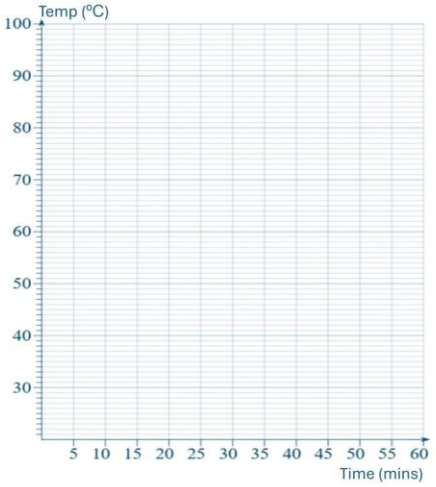
Instructions:

1. Fill the containers with hot water.
2. Measure and record the initial temperature of the water.
3. Cover one container to make it airtight, leaving the other container uncovered.
4. Using an instant-read thermometer, measure the temperature changes in both containers at 5 or 10-minute intervals.

Initial Water Temp: ____°C

5. Record the temperature changes observed in the two containers in the table and plot the heat loss of both containers on the graph.

Time Interval (mins)	Airtight Container (°C)	Open Container (°C)	Temperature Difference
0 mins (Start)	____°C	____°C	____°C



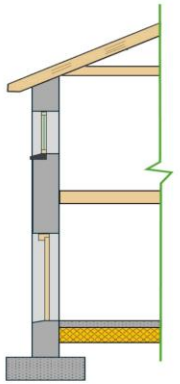
7. Answer the following questions:

i. Why do you think there is a difference in heat loss between the two containers?

ii. Outline the benefits of an airtight building fabric.

8. Research & Investigation:

i. On the image, highlight the areas of the building fabric where air leakage is likely to occur.



ii. Name and sketch two materials that are used to improve airtightness in a building fabric.

iii. Using notes and sketches, describe a test to measure the airtightness of a building fabric.

Teaching for student learning - Activity 2

Activity 2: Fundamental Principles of Construction

2.18 use a variety of presentation techniques and technologies to communicate ideas, thinking, and technical information to complete tasks.
3.1 analyse the important principles in the design of the building fabric.
3.5 identify elements of building fabric and their function in a domestic dwelling.
4.3 explain the principles of heat transfer.
4.4 describe how thermal properties impact the energy efficiency of a dwelling.
4.6 describe measures used to enhance the energy efficiency of new and existing dwellings.

Thermal Conductance and Thermal Bridging

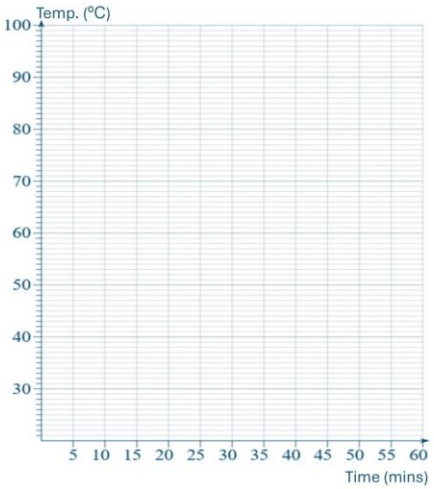
Instructions:

1. Fill the containers, surrounded with different materials, with hot water.
2. Measure and record initial water temperature.
3. Using the instant-read thermometer, measure the temperature changes in the three containers at 5 or 10 minute intervals.

Initial Water Temp: ____°C

4. Record the temperature of each container in the table, and plot the heat loss of the containers in the graph.

Time Interval	1. Container in Air (°C)	2. Container in Concrete (°C)	3. Container in Expanded Polyurethane (°C)
0 mins (Start)	____°C	____°C	____°C



5. Answer the following questions:

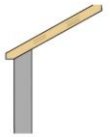
i. Which material would make the building fabric more energy efficient, and why?

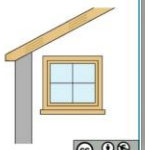
ii. Explain why the thermal performance of Concrete compared to Insulation might impact the energy efficiency of a dwelling.

6. Describe the effects thermal bridging may have on a building fabric, with reference to the following:

- comfort
- energy use
- condition of the building fabric.

7. Using notes and sketches, explore how a combination of materials can prevent heat loss through thermal bridging in the examples below.





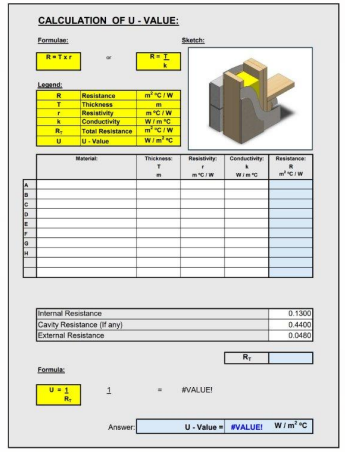
Teaching for student learning - Activities

Oide

Activity 3
Hands-on Learning

Activity 4
Interacting with Materials

Activity 5
Applying Knowledge



- **Work in Pairs**
- **Max 8 people at each table**

Teaching for student learning - Activity 3

A pedagogical approach grounded in hands-on learning

Activity 3: A pedagogical approach grounded in hands-on learning

1.3. evaluate features that contribute to design excellence in housing design.
2.18. use a variety of presentation techniques and technologies to communicate ideas, thinking, and technical information to complete tasks.
4.4. describe how thermal properties impact the energy efficiency of a dwelling.
4.6 describe measures used to enhance the energy efficiency of new and existing dwellings.

Thermal Conductance and Thermal Bridging

1. Measure the ambient temperature of the room, using the appropriate thermometer, to establish a reference temperature and record it

$T_{Reference}$: ____°C

Instant Read Thermometer

Optical Pyrometer

2. Choose an Element of the Building Fabric.

Identify and label the various component parts, and record their temperatures, with the use of a neat annotated sketch.

3. Fill in the table below, and calculate the temperature difference for various component parts of your chosen building element.

Component Part	Material	Temp Difference (°C)
Example: Door Frame	*Timber*	*21-18 = 3 °C*

Use the formula: $(T_{Reference} - T_{Element} = T_{Difference})$

4. Answer the following questions.

i. Describe how the thermal properties of the materials you measured might impact the energy efficiency of a dwelling.

ii. What is happening in the images shown?

iii. Based on your analysis, illustrate what measures could be taken to enhance the energy efficiency of the building fabric detail you measured?

Teaching for student learning - Activity 4

Oide

Direct interaction with materials, tools, or environments

Apply an airtight barrier to the junctions of the building fabric.

Model 1:
Stud Partition with
Waste Water Pipe &
(LSF) Cable extruding

Model 2:
Stud Partition with
Widow Detail.

Scan QRs

DEMO

Watch the demonstration

Teaching for student learning - Activity 4

Direct interaction with materials, tools, or environments

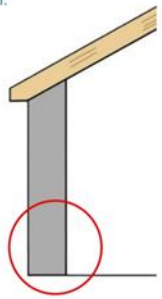
Activity 4: Direct interaction with materials, tools, or environments

4.8 explore airtightness standards, methods, materials and testing for a domestic dwelling.
1.12 apply current health and safety protocols including the appropriate use of Personal Protection Equipment.
2.18 use a variety of presentation techniques and technologies to communicate ideas, thinking, and technical information to complete tasks.

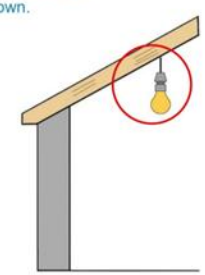
Airtightness

1. Identify the tools in this activity and outline a safety precaution for each.


2. Using notes and freehand annotated sketches, show best practice design detailing to prevent air leakage in the corner shown in the illustration.

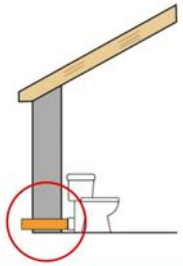


3. Using notes and freehand annotated sketches, show best practice design detailing to prevent air leakage around the electrical cable shown.

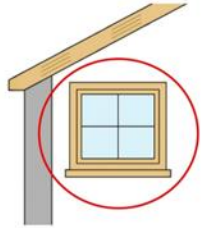


5. Using notes and freehand annotated sketches, show best practice to prevent air leakage around the foul waste pipe shown.

Oide



6. Using notes and freehand annotated sketches, show best practice to prevent air leakage around the window frame shown.



7. What are the advantages of achieving high levels of airtightness in a dwelling?

8. Discuss how airtightness can contribute to the environmental impact of a dwelling.

Teaching for student learning - Activity 5

Apply theoretical knowledge to real-world situations

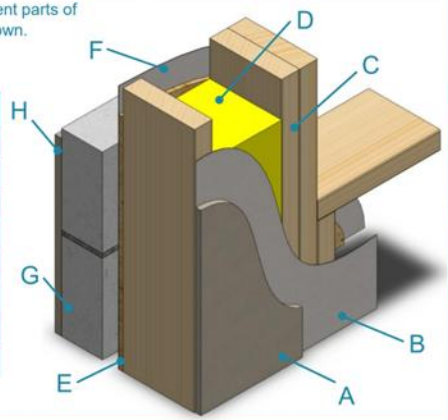
Activity 5: Apply theoretical knowledge to real-world situations

4.4 describe how thermal properties impact the energy efficiency of a dwelling.
4.5 calculate U-value of domestic construction details and the rate, amount, and cost of energy loss in a dwelling.

Heat Loss through Materials

1. List the materials for the component parts of the external timber frame wall shown.

Material	
A	
B	
C	
D	
E	
F	
G	
H	



2. Input the above materials into the "U-value Calculator" Excel file, along with their thicknesses and conductivity values, and calculate the U-value of the external wall.

(Thickness and conductivity values will be provided by your teacher)

U-value of external timber frame wall: _____ W / m² °C

3. What effect does changing the thickness of the insulation have on the U-Value?

4. What effect does changing the type of insulation (with a different conductivity) have on the U-Value?

5. Research – What is the maximum U-value allowed for an external wall in the Irish Building Regulations? _____ W / m² °C

(See: *Technical Guidance Document L, Building Regulations, 2022*)

6. Examine the sample insulation materials and record the effect they have on the U-value of the external wall.

Insulation Type	Thickness (T) m	Conductivity (k) W / m °C	Resistance (R) m² °C / W	New U-value W / m² °C

7. After examining the sample insulation materials, choose a suitable type of insulation and appropriate thickness to use in the wall so that the U-value is below the maximum U-value allowed in the Building Regulations.

Chosen Insulation Type	Thickness Needed (T) m	Conductivity (k) W / m °C

8. Record the data of the wall detail that adheres to the current building regulations, in the table below.

	Material	Thickness (T) m	Resistivity (r) m °C / W	Conductivity (k) W / m °C	Resistance (R) m² °C / W
	Internal Surface				0.1300
A					
B		Ignore: as values are negligible			
C		The timber studs need not be considered in your calculations			
D					
E					
F		Ignore: as values are negligible			
	Cavity				0.4400
G					
H					
	External Surface				0.0480
				Resistance Total (R_T) =	
				U-Value = 1 / R_T = _____ W / m² °C	

9. Research & Investigation:

Discuss how a U-value can impact a dwelling under the following headings:

- thermal comfort
- energy efficiency/usage
- environmental sustainability

U-Value Calculator Excel File

Key Words – Technological and Visual Literacy

Oide

Aims

'……enhance their technological literacy and capability'
'.....enhancing visual literacy,'

NCCA, Leaving Certificate Construction Technology Specification, page 5.

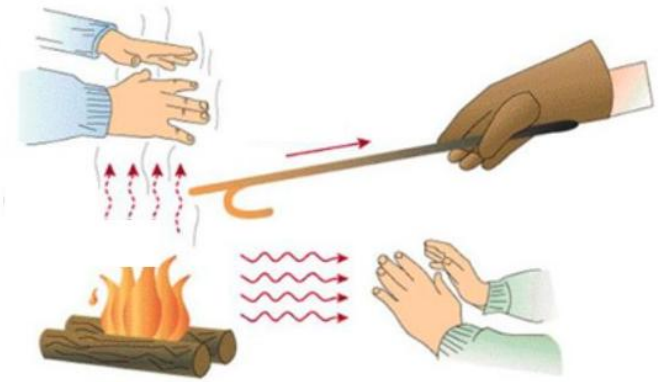
*Literacy encompasses an understanding of the **unique literacy practices** and needs of adolescent learners……*

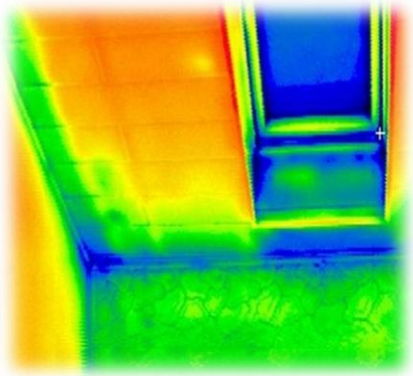
*…Literacy encompasses both **cognitive and technical** skills.*

Ireland's Literacy, Numeracy and Digital Literacy Strategy 2024-2033, page 28.

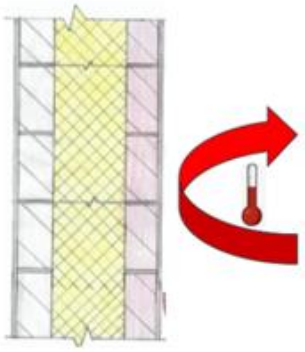
Open discussion

- How can we develop students' Technological and Visual Literacy?
- Suggest ways of recording Technological and Visual Literacy in the classroom?





Write what you learned



Reflecting on the Activity

How do the activities we have just undertaken align with the *'Teaching for student learning'* section in the specification?

"Active and Problem-Based Learning"

"Hands-on Learning"

"Incorporating Digital Tools and Resources"

"Opportunities for Student Agency and Collaboration"

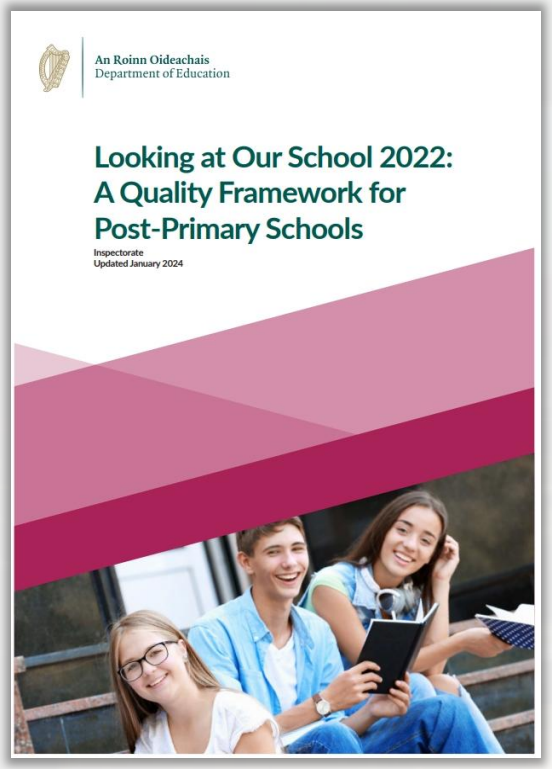
"Direct interaction with materials, tools, or environments related to the subject matter."

"Differentiation"

"Scaffolded learning"

NCCA, Leaving Certificate Construction Technology Specification, pages 24, 25.

Teaching and Learning - *Statements of highly effective practice*



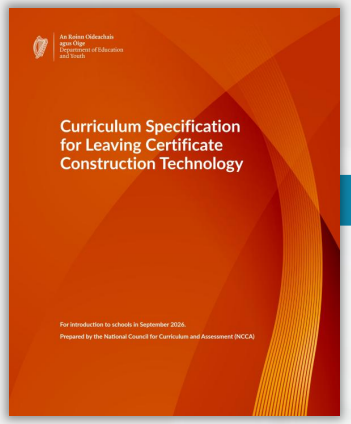
Dimension 1: Learning and Teaching

Domain 2: Learner experiences[7]

Standards	Statements of effective practice	Statements of highly effective practice
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.
	Students display initiative, self-reliance, positive self-esteem and self-confidence. They demonstrate positive learning dispositions such as creativity, problem-solving, time management, critical thinking, resilience, resourcefulness and persistence.	Students display initiative, self-reliance, positive self-esteem and self-confidence. They **ably and actively** demonstrate positive learning dispositions such as creativity, problem-solving, time management, critical thinking, resilience, resourcefulness and persistence.

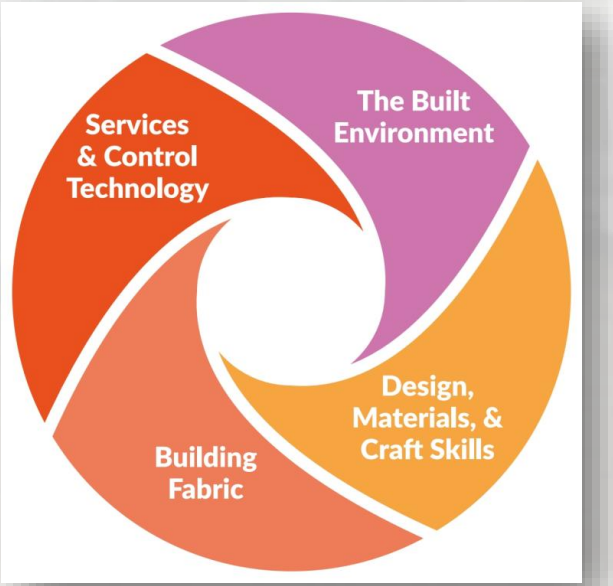
Looking at Our School 2022, Domain 1: Learner experiences, page 28.

Interconnecting the Strands



The specification emphasises a non-linear, integrated approach to learning across the strands.

NCCA, Leaving Certificate Construction Technology Specification, page 12.



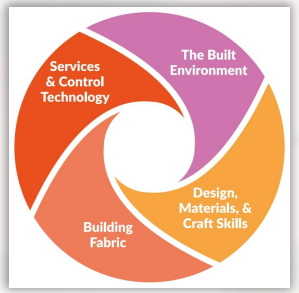
Interconnecting the Strands through Units of Learning

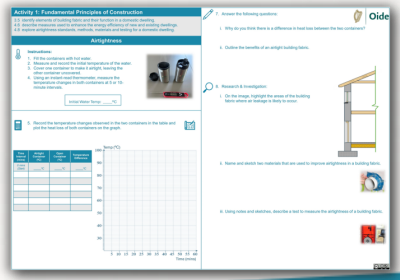
Oide

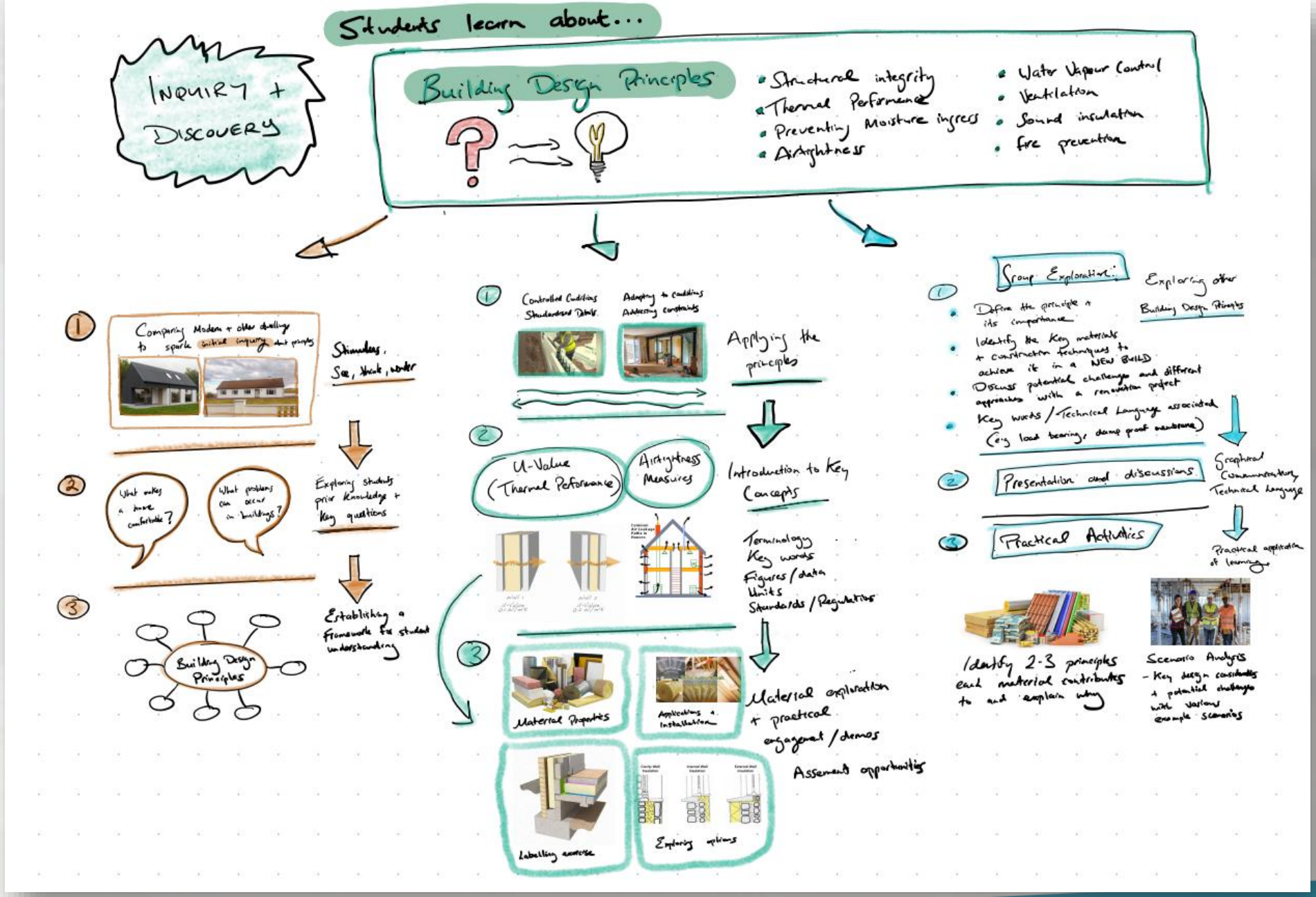
Developing Units of Learning for 5th Year 2026

Pg. 4-13

1. Choose your starting point
2. Interconnect this across the strands
3. Suggest learning experiences/activities you could incorporate
4. Consider resources, UDL & differentiation
5. How are you going to capture learning?






Students learn about...
Inquiry + Discovery
Building Design Principles
Structural integrity
Thermal Performance
Preventing Moisture ingress
Airtightness
Water Vapour Control
Ventilation
Sound insulation
fire prevention
1
Comparing Modern + older dwellings to spark critical inquiry and curiosity
Stimulus, See, think, wonder
2
What makes a home comfortable?
What problems can occur in buildings?
Exploring students prior knowledge + Key questions
3
Building Design Principles
Establishing a framework for student understanding
1
Controlled Conditions Standardised Details
Adapting to Cladding Addressing constraints
Applying the principles
2
U-Value (Thermal Performance)
Airtightness Measures
Introduction to Key Concepts
Terminology
Key words
Figures / data
Units
Standards / Regulations
3
Material Properties
Applications + Installation
Material exploration + practical engagement / demos
Assessment opportunities
Labelling exercise
Exploring options
1
Group Exploration:
Exploring other Building Design Principles
Define the principle + its importance
Identify the Key materials + construction techniques to achieve it in a NEW BUILD
Discuss potential challenges and different approaches with a renovation project
Key words / Technical Language associated (eg load bearing, damp proof membrane)
Graphical Communication/ Technical language
2
Presentation and discussions
3
Practical Activities
Practical application of learning
Identify 2-3 principles each material contributes to and explain why
Scenario Analysis - Key design considerations + potential challenges with various example scenarios

Evolving with the times...

Oide

Electrician 1983

- Wiring circuits, line diagrams.
- Safety and fire protection
- Consumer units

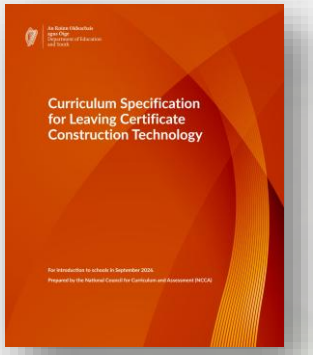
Electrician 2025

- Wiring circuits, line diagrams
- Safety and fire protection
- Smart meters
- Airtightness
- Photovoltaic cells
- Renewable energy
- Smart technology
- Accessibility and Universal Design

Reflecting on the Construction Technology Specification

- At the end of two years, our students will…?
- What Skills, Knowledge, and Values will they have developed?
- How will the new specification affect What and How I will teach?
- How can we contribute to the development of Key Competences?

Open discussion



"The key competencies come to life through the learning experiences and pedagogies teachers choose and through students' responses to them."

NCCA, Leaving Certificate Construction Technology Specification, page 9.

Today, we have…

Explore the structure of the Construction Technology specification

Develop a shared understanding of the Rationale and Aims of the Construction Technology specification

Explore the contextual strands of learning in Construction Technology.

Investigate the Learning Outcomes sections with a particular focus on the Action Verbs.

Experience a Unit of Learning that integrates the strands of the Construction Technology specification.

Develop learning experiences that promote an integrated approach.

Oide

Tacú leis an bhFoghlaim Ghairmiúil i measc Ceannairí Scoile agus Múinteoirí

Supporting the Professional Learning of School Leaders and Teachers

End of Slideshow