SENTINUS YOUNG INNOVATORS 2026

Competition Guidelines for Applicants

1. Overview

Sentinus Young Innovators is Northern Ireland's flagship STEM competition, celebrating innovation, creativity, and problem-solving among post-primary students.

Students from across Northern Ireland and the Republic of Ireland are invited to apply. Finalists will present their work at the live finals event held at **Ulster University, Belfast** on **26 November 2026**.

This document provides essential information for students, teachers, and parents.
Please read it carefully before submitting an application.

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2. Competition Categories

Sentinus Young Innovators 2026 includes:

- **Young Scientist of the Year** (Individual or Team – max 3 students)
- **Young Engineer of the Year** (Individual or Team – max 3 students)
- **Young Mathematician of the Year** (Individual)
- **Young Coder of the Year** (Individual)

An overall **Sentinus Young Innovator of the Year** will be selected from the winners of the Young Scientist and Young Engineer categories.

PART A

YOUNG SCIENTIST & YOUNG ENGINEER

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3. Entry Format (Young Scientist & Young Engineer Categories)

Students may:

- Choose one of the official project themes provided by Sentinus, or
- Propose their own original project.

Team Size

- Individuals or teams of up to **three students**

Final Submission

All entrants must submit a **research-based academic poster** summarising:

- The problem or research question
- Background research

- Methodology
- Data / analysis
- Conclusions
- Proposed solutions or recommendations

Submission Deadline for Completed Posters

6th November 2026

Posters will be judged to select finalists.

Shortlisted finalists will be invited to present their work in person at the finals on **26 November 2026**.

If selected, students may continue refining and improving their project before the final event.

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4. Judging Criteria (Young Scientist & Young Engineer)

Projects will be assessed using the following criteria:

1. Innovation

- Original thinking
- Creative yet realistic solutions

2. Scientific / Engineering Method

- Clear and focused research question
- Logical methodology
- Appropriate investigative approach

3. Evidence and Analysis

- Quality of data collection
- Depth of analysis
- Justified conclusions

4. Local Relevance

- Clear local context
- Practical applicability

5. Communication

- Professional poster design
- Clarity of explanation
- Effective use of diagrams, charts, and visuals

5. Project Themes

Students may select one of the following themes or propose their own scientific investigation.

5.1 Net Zero Neighbourhoods: Smart Solutions for Local Climate Action

Your challenge:

Investigate how your local neighbourhood could move toward Net Zero emissions.

Your project may explore:

- Renewable energy adoption
- Sustainable transport
- Smart home energy systems
- Community behaviour change
- Green infrastructure
- Circular economy initiatives

Example research questions:

- To what extent could solar panel adoption reduce emissions in a specific NI community?
- How effective are community-based energy schemes?
- Can smart energy monitoring reduce household consumption?

5.2 Mind Matters: Science and Innovation for Youth Mental Health

Mental wellbeing is a growing concern for young people.

Your challenge:

Investigate a scientifically measurable factor affecting adolescent mental health.

Possible areas include:

- Impact of sleep on brain development
- Effects of screen time
- Stress and cortisol levels
- Adolescent brain plasticity

- Digital wellbeing tools
- AI chat support systems

Example research questions:

- Does sleep deprivation affect academic performance and mood?
- How effective are school-based mindfulness programmes?
- Can digital mental health apps reduce anxiety in teenagers?

5.3 Water: Improving Water Quality and Storage

Clean water is essential for public health, agriculture, and ecosystems.

Your challenge:

Investigate how water quality or storage systems could be improved using scientific methods.

Possible areas include:

- Agricultural runoff
- River water testing
- Filtration systems
- Microplastics
- Rainwater harvesting
- Climate-related water security

Example research questions:

- How effective is a low-cost filtration system?
- Can rainwater harvesting improve sustainability in schools?
- How does climate change impact reservoir storage capacity?

YOUNG ENGINEER OF THE YEAR

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6. Project Themes

Students may select one of the following engineering challenges or propose their own engineering-focused project.

Your project must:

- Be engineering-based
- Include measurable analysis

- Propose realistic design solutions

6.1 Flood Futures: Engineering for Extreme Weather

Flooding poses significant risks across the world.

Your challenge:

Investigate how engineering solutions can reduce flood risk and improve resilience.

Possible areas include:

- Sustainable drainage systems (SuDS)
- Flood barriers
- Natural flood management
- Coastal protection
- Cost-benefit analysis of flood defences

Example research questions:

- To what extent can SuDS reduce surface water flooding?
- What is the most cost-effective flood defence strategy for a chosen town?

6.2 Retrofit Revolution: Engineering Greener Buildings

Buildings contribute significantly to carbon emissions.

Your challenge:

Analyse an existing building (home, school, community building) and evaluate retrofit solutions to reduce its carbon footprint.

Possible areas include:

- Insulation improvements
- Heat pumps vs oil boilers
- Smart energy systems
- Energy efficiency modelling
- Cost-to-carbon reduction comparisons

Example research questions:

- How effective are heat pumps in older properties?
- What retrofit combination gives the greatest carbon reduction per £ spent?

6.3 Smart Streets: Engineering Safer, Greener Travel

Transport is a major contributor to emissions and safety concerns.

Your challenge:

Design or evaluate engineering improvements to a real local street or transport corridor.

Possible areas include:

- Cycle lane design
- Smart traffic systems
- Junction redesign
- Active travel infrastructure
- Data-driven traffic modelling

Example research questions:

- Can segregated cycle lanes reduce congestion and emissions?
- How effective are smart traffic lights at reducing idle emissions?

PART B

YOUNG MATHEMATICIAN OF THE YEAR

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7. Overview

Applicants must:

- Provide details of academic achievements in mathematics
- Outline extracurricular maths activities or special interests
- Provide contact details for a mathematics teacher (who will provide a reference)

Selection Process

Successful students will be invited to the finals event on 26 November 2026, where they will complete a 90-minute mathematics challenge.

Selection is based on:

- Application information
- Teacher reference

YOUNG CODER OF THE YEAR

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8. Overview

Applicants must:

- Provide details of academic achievements in coding/computer science
- Outline extracurricular coding activities or personal projects
- Provide contact details for a subject teacher (who will provide a reference)

Selection Process

Successful students will be invited to the finals event on 26 November 2026, where they will complete a 90-minute coding challenge.

Coding challenges will be using **Python**

Selection is based on:

- Application information
- Teacher reference

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9. Important Dates

- **Application Deadline:** 31st October 2026
- **Poster Submission Deadline (Scientist & Engineer):** 6th November 2026
- **Finals Event:** 26th November 2026

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10. Final Notes

- All work must be the students' own.
- Projects must be suitable for public presentation.
- Teams must not exceed three members.
- Late submissions will not be considered.