

# Levelling Up Physics

## Evaluation Toolkit

New University Onboarding Pack | Document 3 of 3 | v1.0 28/4/26

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## Introduction

Evaluating Levelling Up Physics supports improving the programme and making the case about effectiveness to both institutional and external stakeholders and funders. This toolkit provides some advice and suggestions for approaches to planning evaluation, collecting and analysing data and reporting on your programme's impact. Using the ideas in this toolkit also supports collective evaluation of the programme nationally, having an element of consistency to allow amalgamation of data. It is not intended to be prescriptive or exhaustive but instead to provide ideas that can be adapted to your local context. The general approach suggested involves mapping the intended impact of running Levelling Up Physics in your institution and then using a mixed-methods approach to gathering evidence, combining the use of quantitative attitude surveys, free-text responses, and focus group data.

*Ideas in this toolkit have been used in the following published article: Cottle, D., Willett, E. and Wright, T. (2025) European Journal of Physics, 46, 055702.*

## 1. Theory of Change and Logic Model

A Theory of Change (ToC) is a structured way of mapping the logical pathway from what a programme does to the difference it makes. For Levelling Up Physics, articulating this pathway is important for three reasons: it clarifies what the programme is trying to achieve and why in your institutional context; it guides decisions about what to measure and when; and it makes sure that evaluation findings are closely tied to intended outcomes facilitating clear communication to stakeholders.

The Logic Model framework below — drawing on the approach developed by the Levelling Up Physics steering group and presented by Mark Fuller and Wakami Soh (University College London) — organises the programme into four columns: Inputs, Outputs, Outcomes and Impact. Reading left to right, each column shows how the resources and activities of the programme produce short-term changes in participants and tutors, which over time contribute to longer-term shifts in physics participation. The framework is completed below by way of an example but to be most useful, we recommend contextualising it and developing it in your specific context.

## The Levelling Up Physics Logic Model

INPUTS	OUTPUTS	OUTCOMES	IMPACT
What we use	What we do and who we reach	Short-term results	Long-term aims
<p><b>Human resources</b></p> <ul style="list-style-type: none"> <li>• UG and PG physics student tutors</li> <li>• Programme coordinator (staff time)</li> <li>• Steering group members across institutions</li> </ul> <p><b>Materials &amp; technology</b></p> <ul style="list-style-type: none"> <li>• Jointly produced tutorial and mentoring materials</li> <li>• Online platform (Zoom/Teams)</li> <li>• Isaac Physics problem sets</li> </ul> <p><b>Funding</b></p> <ul style="list-style-type: none"> <li>• Philanthropic donation</li> <li>• University departmental resource</li> </ul> <p><b>Participants bring</b></p> <ul style="list-style-type: none"> <li>• Some prior A-level physics knowledge</li> <li>• Interest in physics/university</li> <li>• Potential misconceptions about university study</li> <li>• Experience of limited peer support in school</li> </ul>	<p><b>Activity</b></p> <ul style="list-style-type: none"> <li>• Weekly online tutorial/near-peer mentoring over several months</li> <li>• 12 physics curriculum tutorials</li> <li>• 9 mentoring sessions on university life</li> <li>• Small groups of 8–12 participants</li> </ul> <p><b>Reach</b></p> <ul style="list-style-type: none"> <li>• Number of participants per year</li> <li>• Recruited from groups underrepresented in physics</li> <li>• Both participants and near-peer tutors benefit</li> </ul> <p><b>Process</b></p> <ul style="list-style-type: none"> <li>• Tutor training in online pedagogy and safeguarding</li> <li>• Steering group oversight and quality assurance</li> <li>• Mid-point review and programme adjustment</li> </ul>	<p><b>Knowledge</b></p> <ul style="list-style-type: none"> <li>• Increased knowledge of A-level physics topics</li> <li>• Improved understanding of what university physics study is like</li> <li>• Greater knowledge of the university application process (UCAS, personal statements)</li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• Improved physics problem-solving skills</li> <li>• Developed study skills and self-discipline</li> <li>• Communication and teamwork skills (for tutors)</li> <li>• Teaching and explanation skills (for tutors)</li> </ul> <p><b>Attitudes</b></p> <ul style="list-style-type: none"> <li>• Increased confidence in physics knowledge and skills</li> <li>• Increased motivation to study physics at university</li> <li>• Stronger sense of belonging in physics</li> <li>• Greater belief that physics is</li> </ul>	<p><b>Ultimate aim</b></p> <p>A more diverse range of students — across gender, ethnicity and socioeconomic background — studying physics in UK higher education.</p> <p><b>Intermediate impacts</b></p> <ul style="list-style-type: none"> <li>• Increased progression of underrepresented groups from Levelling Up into physics degrees</li> <li>• Contribution to host university's Access and Participation Plan targets</li> <li>• Physics departments better equipped to take sustained action on diversity</li> <li>• Improved secondary physics teaching pipeline (via tutors who enter teaching)</li> </ul> <p><b>System-level change</b></p> <ul style="list-style-type: none"> <li>• Physics community that better reflects the diversity of the UK population</li> <li>• Evidence base informing national widening participation policy</li> <li>• Sustainable collaborative model of outreach adopted widely across institutions</li> </ul>

		'for people like me' <ul style="list-style-type: none"> <li>Improved confidence for tutors as communicators</li> </ul> <b>Behaviour</b> <ul style="list-style-type: none"> <li>Increased likelihood of applying to study physics at university</li> <li>More informed university choices</li> <li>Tutors considering careers in physics education</li> </ul>	
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## How the Logic Model Connects to Your Evaluation

Each column of the logic model can then map to suggested data collection instruments. The table below suggests which data sources provide evidence for different stages of the theory of change:

Logic Model Stage	What to measure	Suggested Data Collection
<b>Inputs</b>	Who participated; tutor profile; resource deployed	Demographic surveys; programme records
<b>Outputs</b>	Session attendance; group size; tutor training completed; safeguarding compliance	Attendance data, coordinator log; pre-launch checklists
<b>Outcomes: Knowledge</b>	Understanding of university study; physics knowledge improvement	Attitudes to Physics Survey, focus group
<b>Outcomes: Skills</b>	Study skills; self-discipline; tutors' teaching skills	Free Text Survey, Tutor Survey
<b>Outcomes: Attitudes</b>	Confidence; motivation; sense of belonging; enjoyment of physics	Attitudes Survey, Evaluation Survey
<b>Outcomes: Behaviour</b>	Intention to apply; university choices made; tutors' career decisions	Evaluation Survey, Tutor Survey
<b>Impact</b>	Progression to physics/related degrees; diversity of entrants	Progression tracking (6–12 months post-programme)

*The evaluation tracks whether the programme is being delivered as intended (Inputs → Outputs). Impact evaluation assesses whether it is making the difference it aims to*

*make (Outcomes → Impact). Both are needed for a complete picture. The data collection instruments in this toolkit address both levels.*

## 2. Evaluation Framework Overview

The Levelling Up Physics evaluation uses three types of data collection, administered at multiple points across the programme:

Data Type	When	Purpose
<b>Demographic survey (part of application process?)</b>	Before start in application process	Understand who is participating; measure diversity against targets
<b>Attitudes to physics survey (Likert)</b>	Start, Mid, End	Track change in attitudes across the programme
<b>Programme evaluation survey (Likert + free text)</b>	Mid, End	Measure perceived benefit; collect qualitative feedback
<b>Focus group</b>	End (recommended)	Generate rich qualitative insight into participant experience
<b>Tutor feedback survey</b>	End	Capture impact on tutors; identify training and support needs
<b>Progression tracking</b>	6–12 months post	Track university destinations; measure long-term impact

## 3. Demographic Data Collection

Collecting demographic data supports the selection of participants for Levelling Up Physics using widening participation criteria and supports demonstrating that the programme is reaching its target groups. Where possible it is useful to use HESA categories for such data.

*GDPR Advice: As demographic data could be classed as sensitive personal data under UK GDPR there we recommend considering whether there may be a need to obtain advice from your institutions data protection officer or seek ethical consent to hold or process it.*

### Suggested Demographic Questions

Question	Guidance
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<b>Gender</b>	Include: Male / Female / Non-binary / Prefer to self-describe / Prefer not to say. Align with HESA categories.
<b>Ethnicity</b>	Use the standard ONS/HESA 18-category classification. Include 'Prefer not to say'. Allows comparison with national UG data.
<b>Postcode</b>	Use to determine IMD quintile (Index of multiple measures of deprivation). Tool available via <a href="https://imd-by-postcode.opendatacommunities.org/imd/2019">https://imd-by-postcode.opendatacommunities.org/imd/2019</a> . Many providers prioritise quintiles 1 and 2 for participation.
<b>Parental HE education</b>	Did either of your parents/guardians attend university? (Yes / No / Not sure / Prefer not to say)
<b>Household income indicator</b>	Is household income lower than threshold for Student Finance England maintenance loan? (£42,875) (Yes / No / Not sure / Prefer not to say)
<b>Free School Meals (FSM)</b>	Are you eligible for Free School Meals now or previously? (Yes / No / Not sure / Prefer not to say) – commonly used indicator of socio-economic deprivation in schools.
<b>School/college type</b>	State school / Academy / Grammar / Independent / College / Other.
<b>Intended subject at university</b>	Physics / Astrophysics / Engineering / Mathematics / Other STEM / Unsure

## 4. TASO Evaluation Links

TASO provides some evidence based tools for evaluating access and success based activities in higher education. These instruments are not specifically tailored to physics based activities but are worth investigating:

<https://taso.org.uk/libraryitem/access-and-success-questionnaire-asq/>

## 5. Attitudes to Physics Survey

Could be administered at three points: before the programme, at the mid-point, and at the end. Tracks changes in participants' attitudes to physics. Uses a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

### SURVEY INSTRUMENT A — Attitudes to Physics

Participant name/ID: \_\_\_\_\_ Date: \_\_\_\_\_ Time point:  
 Start  Mid  End

*Please indicate how much you agree or disagree with each statement.*

Q	Statement	1 Strongly Disagree	2 Disagree	3 Neither	4 Agree	5 Strongly Agree
1	I enjoy physics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2	I feel confident in my physics knowledge and skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	I know what it is like to study physics at university	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	I would like to have a career involving physics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	I know how to improve my physics knowledge and skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	I think physics is useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	I think physics is difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Note: Q7 ('I think physics is difficult') is a negative indicator — higher scores do not necessarily reflect negative outcomes, as recognising difficulty is normal in physics learning.

## 6. Programme Evaluation Survey

Could be administered at the mid-point and end of the programme. Measures participants' perceptions of the impact of Levelling Up Physics on their attitudes, confidence, and career thinking, and collects qualitative feedback.

### SURVEY INSTRUMENT B — Programme Evaluation (Likert Section)

Participant name/ID: \_\_\_\_\_ Date: \_\_\_\_\_ Time point:  
 Mid  End

Please indicate how much you agree or disagree with each statement about Levelling Up Physics.

Q	Statement	1 Strongly Disagree	2 Disagree	3 Neither	4 Agree	5 Strongly Agree
1	Levelling Up has given me new insights into physics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Levelling Up has helped me understand how to apply physics in different situations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	Levelling Up has improved my confidence in physics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	Levelling Up has improved my views about how useful physics is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	Levelling Up is something I would recommend to others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	My interest in physics has increased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	My motivation to study physics has increased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	The likelihood of me studying physics at university has increased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9	Levelling Up has changed my views about what career I would like to pursue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	Levelling Up has made me want a career where physics is essential	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11	Levelling Up has made me want to have a career where being good at physics is beneficial	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12	Levelling Up has made me less likely to follow a career where physics skills are required	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13	The tutors I have worked with have always been high quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Note: Q12 is a negative indicator (reverse-coded). Low agreement here is a positive outcome.

## SURVEY INSTRUMENT B (continued) — Free Text Questions

Please answer the following questions in your own words. There are no right or wrong answers.

Q	Question and response space
14	Why did you decide to participate in Levelling Up Physics?  <hr/>
15	What have you found most useful about Levelling Up Physics?  <hr/>
16	What has helped to maintain your interest in completing the Levelling Up programme?  <hr/>

## 7. Focus Group Guide

Focus groups with participants can provide rich qualitative data that enhances and extends data that surveys provide. Involve 4–8 participants, facilitate independently from the tutors, and run for approximately 45 minutes.

### **Section 1: Knowledge and Understanding (10 minutes)**

- Before you joined Levelling Up Physics, how much did you know about what it is like to study physics at university?
- Has your knowledge of this changed since joining? In what ways?
- What do you think are the biggest challenges for people like yourself in applying to study physics at university?

### **Section 2: Physics Learning (10 minutes)**

- Can you give an example of something you have learned or understood better through the Levelling Up tutorials?
- How did the tutorials compare to your physics lessons at school? What was different?
- Did any particular topic stand out as especially useful or interesting?

### **Section 3: Skills and Confidence (10 minutes)**

- Have you developed any particular skills through Levelling Up Physics? (Prompts: problem solving, communication, study skills, self-discipline)
- How has your confidence in physics changed since joining the programme?
- How has your understanding of how to improve your physics skills changed?

### **Section 4: Community and Belonging (10 minutes)**

- What has it been like to be part of the Levelling Up Physics group?
- Has being part of the group changed how you feel about studying physics at university?
- What has helped you keep attending week after week?

### **Section 5: University Aspirations (10 minutes)**

- How likely are you now to apply to study physics or a related subject at university? Has this changed?
- How has your thinking about careers involving physics changed, if at all?
- What advice would you give to a student thinking about applying for Levelling Up Physics next year?

### **Closing (5 minutes)**

- Is there anything else about your experience of Levelling Up Physics that you would like to share?

- How could the programme be improved?

## 8. Tutor Feedback Survey

Capturing feedback from tutors is important for understanding the dual benefit of the programme and for improving tutor support. Administer at the end of the programme.

### SURVEY INSTRUMENT C — Tutor Feedback

Tutor name (optional): \_\_\_\_\_ Year of study: \_\_\_\_\_

*Please indicate how much you agree or disagree with each statement.*

Q	Statement	1 Strongly Disagree	2 Disagree	3 Neither	4 Agree	5 Strongly Agree
1	Participating as a tutor has improved my ability to explain physics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Participating has improved my confidence as a communicator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	I feel I have made a positive difference to the participants I worked with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	The training I received prepared me well for my role as a tutor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	The support I received from the programme coordinator was adequate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	Participating has strengthened my CV and employability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	I would recommend being a Levelling Up Physics tutor to other students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	Participating has influenced my thinking about a career in education or science communication	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q	Open questions
9	What was the most rewarding aspect of being a Levelling Up Physics tutor?  <hr/>
10	What was the most challenging aspect? How did you manage it?  <hr/>

<b>11</b>	What additional training or support would have been helpful?
<b>12</b>	Is there anything you would change about the programme?

## 9. Progression Tracking

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Tracking participants after they complete Levelling Up Physics is one of the most challenging aspects of evaluation because programmes typically complete around 12 months before participants begin their university courses. Suggestions for this are:

- Ask participants at programme end for permission to contact them about their UCAS outcomes and obtain a lasting email address.
- Track for participants who start degree courses at your own university.
- Send a brief end-of-year email to all participants asking where they ended up.

## 10. Annual Evaluation Report: Suggested Structure

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You are requested to complete an annual online form to report on the impact of Levelling Up Physics in your institution to the national steering group. From time to time we also discuss case studies and examples at steering group meetings for the purpose of learning from the experiences of others. Brief written annual reports are also useful in reporting to different institutional stakeholders. A suggested format for reporting evaluation is:

Section	Contents
<b>Executive Summary</b>	One page: who participated, key outcomes, headline statistics.
<b>Programme Description</b>	How the programme ran this year, including local adaptations.
<b>Participant Demographics</b>	Gender, ethnicity, IMD, school type. Comparison to national benchmarks.
<b>Survey Findings: Attitudes to Physics</b>	Pre/mid/post comparison

<b>Survey Findings: Programme Evaluation</b>	Mid and end-point data. Percentage agree/strongly agree. Key themes from free text.
<b>Focus Group Findings</b>	Thematic analysis with supporting quotations.
<b>Tutor Feedback</b>	Summary of tutor survey data and open question themes.
<b>Progression Data</b>	University destinations of participants where known.
<b>Conclusions and Recommendations</b>	What worked well. What to improve. Changes planned for next cohort.

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## Contact and Further Information

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## References

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Cottle, D., Willett, E. and Wright, T. (2025) European Journal of Physics, 46, 055702.

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