



Department for  
Science, Innovation  
& Technology

# National Academy for Mathematical Sciences: Call for evidence

Summary of Government Response to Call  
for Evidence

Response date: 27 March 2024



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# Contents

Overview	4
Background	4
Responses to the Call for Evidence and Engagement	5
Government Response	10
Draft requirements for establishing a National Academy focused on the Mathematical Sciences	10
Next Steps	13

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# Overview

## Background

1. On 22 November 2023 the Government announced its intention to support the creation of a National Academy focussed on mathematical sciences. Further to that, a [Call for Evidence](#) was run by the Department for Science, Innovation and Technology (DSIT) to help develop the objectives of the prospective Academy and explore how it could be delivered.
2. The support for the creation of a National Academy focussed on mathematical sciences builds upon the recommendation of Professor Philip Bond's independent review 'The Era of Mathematics Review'<sup>1</sup> and was committed to as part of the Government response to the independent Review of the Research, Development and Innovation organisational Landscape, led by Sir Paul Nurse.<sup>2</sup> This work recognises the need to build mathematical capabilities in the UK and the importance of providing support to the sector in a long-term and sustainable way.
3. The Call for Evidence sought views from respondents to inform judgements on what the objectives of a National Academy should be and how a new or existing organisation could support the objectives chosen. The draft objectives that the Government sought feedback on were:
  - Helping the sector to speak with one voice, developing clear and consistent positions on how to promote and enhance mathematical sciences at all levels, and across all areas of society;
  - Promoting mathematical sciences in ways which support economic growth and societal benefits;
  - Convening, coordinating, and assessing views and evidence from across the mathematical community so as to provide high-quality independent advice to government and society;
  - Strengthening the UK's mathematical sciences community, working constructively with the learned societies and forging links across academia, industry, government and wider civil society; and
  - Promoting the benefits of mathematical sciences and develop strategies to boost uptake of skills, qualifications, and careers in the UK.
4. To gather this information, DSIT outlined four questions for stakeholders to respond to:
  - i. Are these the correct objectives for a National Academy focused on the mathematical sciences to pursue? Are there any other objectives that the new organisation should pursue?

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<sup>1</sup> <https://www.ukri.org/publications/the-era-of-mathematics/>

<sup>2</sup> DSIT, November 2023. Government Response to the Landscape Review 'Evolution of the Research, Development and Innovation Organisational Landscape'  
[https://assets.publishing.service.gov.uk/media/655e2a2f1b00a6000d58e60a/evolution\\_of\\_rdi-organisation-landscape-government-response.pdf](https://assets.publishing.service.gov.uk/media/655e2a2f1b00a6000d58e60a/evolution_of_rdi-organisation-landscape-government-response.pdf)

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- ii. HMG is prepared at this stage to provide funding to support the initial establishment of a new organisation, but we are conscious that the future possibilities here are broad. Given this, what activities should the organisation specifically focus on in the first 1-2 years of its work, and what should it explore developing for the longer term?
  - iii. There are a wide range of individual and organisational stakeholders already doing valuable work in the area, ranging from academics, to learned societies to the four established National Academies<sup>3</sup>. How should the new organisation work to complement these established entities and draw together their work?
  - iv. The UK is home to many of the world's best scientific institutions, some dating back centuries and some much more recent, what lessons can the new institution learn from the experience of these organisations?

## Responses to the Call for Evidence and Engagement

### Overview

5. The Call for Evidence opened on 12 January and closed on 25 February 2024. DSIT received 53 written submissions from stakeholders across the mathematical sciences sector.
6. Responses were received from:
  - Individuals/groups of individuals (16 responses)
  - Universities (5 responses)
  - Charities or social enterprises (9 responses)
  - Research organisations (6)
  - Businesses (5)
  - Business representatives/trade body (2)
  - Learned Societies (4 responses)
  - Other (6 responses)
7. Alongside this process, DSIT has spoken to over 100 people with key roles in the sector through a series of webinars and round tables.
8. As noted when the Government opened the Call for Evidence, the mathematical sciences sector in the UK is vibrant and innovative, with voices across academia, government, industry and non-profit sectors. This was reflected in the enthusiasm, detail and breadth of the responses received. Given the significant number of inputs received we will not attempt to cover every point made, but instead summarise the key themes.

### Summary of Responses

#### ***Establishment of a National Academy focused on mathematical sciences***

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<sup>3</sup> The Royal Society, British Academy, Royal Academy of Engineering, and the Academy of Medical Sciences.

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9. There was considerable enthusiasm for the Government's ambition to support the establishment of an incipient National Academy focussed on mathematical sciences. There was also clear endorsement from the mathematics community for an incipient National Academy to have a UK-wide remit and to be representative of the sector across all four nations.

### ***Objectives for a National Academy***

10. There was broad support for the initial objectives set out by DSIT in the Call for Evidence. Various recommendations were made for enhancing those objectives, including by building in the need for an incipient National Academy to champion diversity and inclusion across the sector and requests to consider the role that a National Academy could play in supporting mathematical sciences education at all stages in the UK.
11. Contributors identified a wide range of long-term strategic opportunities and challenges where a National Academy could take a leading role. They also identified how an organisation seeking to establish itself as a National Academy could best develop itself in the short term and provide immediate support to the wider sector.
12. Contributors noted a number of trade-offs that must be carefully balanced and assessed if the organisation is to be effective. In particular, it must support and build upon the existing infrastructure and range of excellent work being carried out by established organisations in the sector. Such an organisation should be established with the clear aim of complementing existing structures and programmes, avoiding duplication or cutting across other activity in areas such as accreditation, publications and research funding where this is already sufficiently provided for. It was also highlighted that there would be scope for an incipient National Academy to learn from organisations such as the four established National Academies that have achieved significant success in their respective disciplines.
13. There was recognition that while the possibilities for a new organisation are vast, some prioritisation and realistic objectives will be necessary, especially in the early stages as an organisation establishes itself. A summary of the key themes identified from the Call for Evidence is provided below.

### ***Call for Evidence response themes***

#### **Speaking with one voice**

14. Respondents consistently identified significant and tangible benefits that could be realised by a National Academy that presented the views of the whole mathematical sciences sector in a clear and compelling way. The current absence of a unified voice for the sector was considered to be hindering the ability of the community to advise, influence and support government, industry and broader society. This was drawn in contrast to other disciplines where a single organisation was able to provide a strong and united voice. Therefore, it was proposed that an incipient National Academy would be a vocal advocate for the entirety of mathematical sciences and a single point of contact that could provide credible, independent and expert advice to government. Some considered this could be achieved in part by establishing a broad fellowship of outstanding mathematicians from across the whole of mathematical sciences and also by establishing a strong policy function.

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15. The challenge of attempting to speak on behalf of a diverse sector and to ensure all voices are listened to and fairly represented was noted by many respondents. Simply defining the sector was considered to be difficult and therefore it was suggested that a National Academy would need to be flexible about both the extent and composition of the mathematical community that it is seeking to represent. Establishing strong and effective links and building consensus across the community was seen as crucial to speaking with one voice. This will require sustained consultation with and representation of the full range of voices in the sector, including existing organisations and leading experts from across academia, industry and civil society. These stakeholders should be fully engaged in the ongoing development of, and decisions made by, a National Academy.
  16. Some consideration was also given to the broader engagement that a National Academy would seek to achieve. This was both with other, particularly neighbouring, disciplines and also, in due course, internationally.
  17. A number of practical suggestions were made for building consensus and ensuring a National Academy could speak with one voice, including the need to establish clear and transparent governance and structures that would give confidence that the full range of views would be represented. Gaining the confidence of the sector through proactive collaboration and communication was seen as crucial to rapidly building the credibility of an incipient National Academy and ensuring its ongoing success.

### **Ensuring mathematical skills support economic growth and create societal benefits**

18. Many respondents highlighted that advanced level mathematical skills underpin the development of high-profile government and industry priorities, such as AI and data science driven businesses. At the same time, foundational mathematics skills are essential for every business, charity and public body. As such, respondents were clear that mathematics, and mathematical skills, are key to unlocking economic growth and developing many of the most important industries of the future.
19. The UK is home to many of the world's most innovative and dynamic mathematically enabled businesses and mathematically focussed scientific institutions, as well as to a broad and expert community of mathematicians. However, there was consistent feedback that there is significant potential for industry, government, and academia to work more closely together and build on existing mechanisms for knowledge and staff exchange. There was a consensus that intersectoral mobility for mathematicians across academia, industry and government could help to drive innovation and economic growth. Building capability through knowledge exchange would also help ensure mathematicians in academia can best play a leading role in developing solutions to global challenges we face. Respondents noted the importance of knowledge and staff exchange programmes being underpinned by standards which support wider professional development. In particular, there is a challenge around making sure that expertly trained mathematicians have the ability to use these skills in the applied setting that growth industries require.
20. Many respondents therefore proposed that an incipient National Academy could have a key role in facilitating and encouraging stronger links between mathematicians in academia, industry and government. These links, it was suggested, would have the benefit of amplifying investment in mathematical sciences research, supporting the co-creation of projects with industry, and fostering opportunities for mathematical scientists to spend time working in both academia and industry.

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21. There was some encouragement for a National Academy to play a role helping to attract and retain mathematical talent in the UK and to develop an offer for how it might support existing work in this space. In addition to this, some consideration was given to a possible role in the direct funding of mathematical research.

### **Championing mathematical sciences**

22. Many respondents highlighted the Academy should have a role in supporting the public understanding of mathematics. In part, this role should involve promoting and advertising the importance of mathematical sciences and their uses for industry and in UK society as a whole. It was considered that a National Academy would help build the Government, industry and the public appreciation for, and awareness of, the importance of mathematical sciences, both in general and in reference to driving innovation and supporting the development of solutions to UK and global challenges. Respondents considered this would involve a National Academy supporting the sector in implementing effective strategies to communicate specialist technical knowledge in simpler terms.

23. An additional element raised under this theme was the importance of boosting mathematical literacy (particularly in data and numeracy) and confidence across the broader population.

24. Respondents were clear the organisations should work across the whole of the UK. Recognising the differences between each nation and region, but recognising that the challenges and aspirations are very much the same.

### **The importance of education in mathematical sciences**

25. Closely linked to, and underpinning the successful realisation of, many of the ambitions raised in the above themes, was education in mathematical sciences. The vast majority of respondents highlighted the need for a National Academy to have a role, and an objective, in this space. Improving education in mathematics was seen as a long-term enabler for many of the more ambitious objectives of a National Academy. The responses noted that education is essential to raise the levels of mathematical literacy across the population of the UK and to create a pipeline of talent for our cutting-edge businesses and leading scientific institutions.

26. Many noted that existing organisations and societies already play a key role in this space but that there is scope for complementary activity to drive effective change and improvement across mathematical sciences education. In developing a role in this space, it was suggested that an incipient National Academy would draw upon the expertise of existing mathematical sciences educational organisations.

27. A variety of specific interventions were also identified in this space, ranging from proposals for creating a mathematical sciences skills framework that could be applied at a population level, to focusing on unblocking bottlenecks in the system such as at PhD level, to building skills and support for maths teachers at all levels.

### **Promoting equality of opportunity at all levels of mathematics**

28. Underpinning all of the above themes, we received a consistent message from the stakeholder roundtables and the Call for Evidence, that in order to credibly speak on behalf of the mathematical sciences sector, a National Academy would need to represent and



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champion groups and individuals from a wide variety of backgrounds. This would help increase participation by currently under-represented groups and ensure that all voices are encouraged and represented.

29. Moreover, objectives relating to championing mathematics and enhancing mathematics education at all levels should be pursued across the whole of society, with particular attention paid to addressing current disparities. This was identified as key to broadening the population of talented mathematicians in the UK and promoting equality of opportunity.

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# Government Response

30. DSIT is grateful to all those who took the time to respond to the Call for Evidence and for those who engaged in the stakeholder roundtables. The responses and feedback we have received have provided us with a greater understanding of the value an incipient National Academy focussed on mathematical sciences could bring and where its efforts should be focused. Having carefully considered the responses and feedback we have received we have updated the objectives for a National Academy as follows:

- Helping the sector to speak with one voice, encouraging and respecting diverse views, developing clear and coherent positions on how to promote and enhance mathematical sciences at all levels, and across all areas of society;
- Promoting mathematical sciences in ways which support economic growth and societal benefits, including through forging links between industry and academia;
- Convening, coordinating, and assessing views and evidence from across the mathematical community so as to provide high-quality independent advice to government and society;
- Strengthening the UK's mathematical sciences sector by working constructively with existing organisations and the wider UK R&D sector, expanding and diversifying the talent pool in the UK, and forging links across academia, industry, education, government, global partners and wider civil society;
- Promoting the benefits of mathematical sciences and developing strategies to support the public understanding, trust and proficiency in, mathematical sciences;
- Championing and providing expert advice to enhance mathematical sciences education at all stages, improving mathematical literacy and boosting uptake of skills, qualifications, and careers in all parts of the UK.

## Draft requirements for establishing a National Academy focused on Mathematical Sciences

31. Building on these objectives and on the information that we have received through engagement and responses to the Call for Evidence, we have developed a draft set of requirements which we would expect an organisation that successfully applied for funding to be able to deliver, in order to achieve the objectives of a National Academy focussed on mathematical sciences. These include the key activities and functions the Government expects an organisation in receipt of funding to deliver initially and a non-exhaustive list of longer-term ambitions. Recognising the invaluable insight the sector has offered so far, we are initially inviting comments on the draft requirements by 10 April 2024. We will then finalise the requirements and invite applicants interested in applying for government funding to apply via a competition – more detail on this process can be found at 'Next Steps.'

### Short-Term Requirements (first three years)

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- **Become an established, independent organisation:** Although the successful applicant will be funded by the Government to up to £6 million initially, it will not be a government body or agency and should therefore seek additional sources of funding. While we expect it would build a strong relationship with government departments, it must develop and maintain its own views and policy positions.
  - **Put in place the structures and processes required to provide a single, coherent voice for the mathematical sciences community:** The Government expects the successful applicant to quickly establish the organisational structures required to ensure they can listen to and amplify the broad range of views in the mathematical sciences community. The successful applicant should establish a team of experts, appoint key members of leadership staff and establish policy and engagement functions. Recognising the diversity of individuals and organisations in mathematical sciences, the successful applicant should be careful to define its work and functions in a way that complements the existing activities and work of organisations already operating in the sector.
  - **Publish a strategy setting out a clear vision for the Academy:** In the first three years the successful applicant should be developing a strategy that will enable it to fulfil the longer-term requirements that government would expect a National Academy to be able to fulfil. This will mean putting in place plans for establishing any self-governing fellowship, identifying non-government sources of funding, developing a long-term organisational strategy, and developing strategies to develop mathematical skills across the UK in the long-term.
  - **Provide credible, expert and timely advice on mathematical sciences:** The Government expects the successful applicant to be proactive in providing advice to government, policy makers and industry, helping to shape the agenda on mathematical sciences. Recognising that improving mathematical capabilities in the UK will be a continual process, initially the successful applicant should focus on bringing together views from the sector, complementing the work of others and articulating positions coherently. The successful applicant should also establish a dedicated engagement team to begin to consider where there are opportunities to galvanise public support for mathematical sciences.
  - **Increase public support and engagement in mathematical sciences:** A core ambition should be to support the existing sector in continuing to advocate for and build mathematical capabilities in the UK. In the first three years, government would expect the successful applicant to start building a strong evidence base that can showcase the value of mathematical sciences to the economy and society as a whole. As the UK moves forward with its ambition to become a science and technology super-power, levelling up the public understanding of mathematical sciences will be an important driver for successful policy making. A National Academy would need to consider ways to help the sector modernise the way it communicates and promotes mathematics to the UK public, helping the public to understand and appreciate the value of mathematics and the critical part it plays in underpinning our modern world. This could include outreach activities in schools/academic institutions, as well as events to engage the broader public, showcasing the practical applications and exciting career opportunities in mathematical sciences.

### **Longer-Term Requirements (three years +)**

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- **Have an established self-governing fellowship:** A National Academy would establish a credible fellowship to govern the organisation, representing a diverse and broad range of outstanding people from across the full mathematical sciences community that the Government and wider sector can connect with.
  - **Leverage private and third sector funding:** A National Academy would seek to take advantage of appropriate external funding sources. These might include private donations, sponsorships, or subscriptions amongst other sources. In doing this the organisation must though be careful to safeguard its independence and to avoid harmful competition with its partners. The government also hope that over time a National Academy would be attractive to private philanthropic investment.
  - **Work to improve and develop mathematical skills across the UK:** A National Academy would identify areas of potential improvement between advanced level maths education and the requirements of employers and the wider economy. Particular focus should be given to supporting the UK's competitiveness in advanced mathematical skills that support industries that will underpin future growth and prosperity, including Artificial Intelligence and Data Science. Given feedback received regarding the challenge in ensuring that expertly trained mathematicians can use their skills in the applied setting that growth industries require, a National Academy should find ways to facilitate and assist this, such as delivering tailored programmes and facilitating knowledge exchange. A National Academy should also consider as part of this requirement how to promote a diverse mathematical sciences workforce. A National Academy should find ways to strengthen and broaden the UK talent pipeline by boosting participation and supporting progression.
  - **Develop the capabilities and expertise to represent the sector's views on education:** The ambition would be that, in the future, a National Academy would be capable of contributing valuable perspectives on maths education, especially higher education. A National Academy should look at options for where and how it can add value to support maths education and educators.
  - **Collaborating internationally:** Recognising that the mathematical sciences community stretches overseas and plays an essential role in global challenges, a National Academy should begin to establish its international presence, identifying synergies and areas where international collaboration can be forged. In the future, a National Academy could play a role in raising the international profile of the UK's mathematical community and demonstrate the value of mobility in the sector.
  - **Develop options for programmes that support the objectives set out above:** The Academy could seek funding for these programmes from a variety of sources, including by applying for government funding.

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## Next Steps

32. Having taken initial views from key contributors across the sector, we have a clearer understanding of the value a National Academy focussed on mathematical sciences could bring to the sector.
33. We have used this feedback to refine our objectives for the Academy and would now like to invite a final round of feedback from the sector on the draft requirements for the National Academy. The draft requirements (set out in this government response) list the key activities and functions the Government expects the successful applicant to deliver in both the short term, as it seeks to establish itself as a National Academy, and then in the long-term should it successfully do so. The deadline for this final round of feedback on the draft requirements is 11:59pm on 10 April.
34. Subject to business case approvals, once the final round of feedback has closed, the Government will finalise and publish the objectives and requirements for the National Academy and invite potential applicants interested in delivering such an organisation to come forward and apply. We expect to open this competition in spring 2024.
35. As part of opening this competition, the Government will publish an applicant pack which will include key documents such as the finalised objectives of a National Academy focussed on mathematical sciences as determined by HMG, and the evaluation approach that the Government will take when assessing potential applicants. Applicants will be invited to develop and submit a proposal that demonstrates how they would meet the Academy requirements as set out by Government, both in the short and long-term. Details about the competition stage will be published in due course via a dedicated page on gov.uk. This will be open to all interested parties.
36. The Government hope to be able to announce the successful applicant in summer 2024.
37. Updates will be made to the gov.uk page as this process advances.

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This consultation is available from: [www.gov.uk/government/organisations/department-for-science-innovation-and-technology](http://www.gov.uk/government/organisations/department-for-science-innovation-and-technology)

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