

The National Centre for Excellence in the Teaching of Mathematics (NCETM) and the Further Mathematics Support Programme (FMSP) are supporting the establishment of Further Mathematics Knowledge Networks by funding teacher groups to work collaboratively to develop Further Mathematics knowledge and pedagogy.

The NCETM and FMSP consider mathematical knowledge for teachers of mathematics to have three interrelated dimensions:

- Mathematics content knowledge
- Mathematics-specific pedagogy
- Embedding content knowledge and mathematics specific pedagogy in practice

FMKNs will be expected to explore each of these three dimensions with a view to improving participants' personal practices, as well as having a positive impact on colleagues and learners within their organisations. The networks will normally have teachers drawn from several establishments and would be expected to involve a minimum of 4 and a maximum of 12 teachers. Using the themes given in this guidance, and through collaborative activity, participants will work to develop their practice and support colleagues (including those within the group) who are less experienced. While this work may well encompass generic aspects of teaching and learning, the intention is that there is an underlying focus on developing mathematical knowledge.

The NCETM is offering small amounts of funding to support the development of FMKNs. There will be a simple bidding process, following which the network of teachers will commit to establishing a local network and reporting back to the NCETM and FMSP. It is also expected that, through the NCETM, the group will report to other teachers on their progress and findings.

The selected networks will each be awarded £2,000. The NCETM will provide support and guidance through one of its Regional Coordinators, as well as access to a regional network of teachers of mathematics supported by the NCETM. The FMSP will provide support from its local Area Co-ordinator and a link to a web based package called Elluminate to enable each network to hold live, online meetings.

Each FMKN will be provided with a briefing pack to support enquiry into their chosen aspect of Further Mathematics teaching and learning. These briefing packs will be freely available for use by FMKN teachers and found in the Further Mathematics microsite and in the Teacher Enquiry section of the NCETM portal. Here you will also find details of the full range of support we offer for teacher enquiry.

The themes for FMKNs:

- 1. Strengthening Mathematical Knowledge**
What models of teachers working together on their own subject knowledge in Further Mathematics are effective as vehicles for rich CPD?
- 2. The use of NCETM portal tools**
How can the Further Mathematics tools, sources and resources on the NCETM web portal support professional learning in further mathematics?
- 3. The use of appropriate resources such as the FMSP online resources, to support the teaching and learning of Further Mathematics**
4. How can online resources be used to improve the subject knowledge and confidence of potential Further Mathematics Teachers?
- 5. Pedagogy to develop the independent learning skills of Further Mathematics Students.**
How can Further Mathematics students be encouraged to learn mathematics more independently, in preparation for university study in STEM subjects?
- 6. Using assessment to promote learning in Further Mathematics**
What forms of assessment are most supportive of learning Further Mathematics and how can they be effectively and efficiently integrated into classroom teaching and independent learning?
- 7. Exploring and developing rich mathematical tasks for Further Mathematics**
An investigation into what constitutes a rich mathematical task for Further Mathematics students and what kinds of tools, resources and classroom practice can support the use of such tasks in classrooms.
- 8. Developing links with Higher Education and/or industry**
How can local universities and/or industry work with teachers, and potential teachers, of Further Mathematics, to develop their subject knowledge and help them to advise students who may aspire to degree courses and/or careers rich in mathematics?
- 9. Supporting and mentoring new teachers of Further Mathematics**
How can teachers who have not taught Further Mathematics before be supported and encouraged?

What is expected of colleagues participating in a funded MKN?

- Appropriate meetings should be planned for the network. These could include whole group or part group online meetings using Elluminate. The meetings must be about professional development for the teachers involved and focused around promoting improvements in teaching & learning;
- Activities will promote development of a culture of professional dialogue within the group;
- Members of the FMKN should register on the NCETM web portal;
- Members schools/colleges should be registered with the FMSP;
- Clear objectives and milestones will be agreed, and progress towards these monitored throughout the life of the network;
- Interim and final reports on progress and outcomes must be submitted according to the timescales outlined below. These reports will be posted on the NCETM further mathematics microsite.

N.B. Although we would expect many networks to develop a shared leadership approach to working, the NCETM will consider the applicant for funding to be the key group contact.

Other suggestions for colleagues participating in a funded FMKN

- Participants could use the NCETM personal learning space to document and record their own activity, learning and reflection in preparation for contributing to the interim and final reports;
- It is hoped that participants will engage beyond the network, for example by making contributions to the NCETM web portal in the form of group or individual blogs, Mathemapedia entries and involvement in online discussions;
- One or more members of the group should be willing to take on the role of NCETM ambassador; i.e. to disseminate the findings of their NCETM project as widely as possible and to promote the collaborative approach to professional development encouraged through the FMKN initiative.

What are the timescales?

- Applications must be submitted electronically to info@ncetm.org.uk **on or before noon on Monday 21st December 2009**
- Applicants will be informed of the outcome on or before **Friday 8th January**. On acceptance of an offer of MKN funding, an initial payment of £1 000 will be released to the applicant's school/college.
- The applicant will be contacted by their FMSP Area coordinator who will help set up the first network meeting in January/February 2010.
- A brief interim report on progress, with plans for this academic year should be submitted following this meeting, no later than by **Friday 5th March 2010**. This will trigger release of the final £1 000 funding.

How can the funding be used?

All supported FMKNs will receive funding of £2 000 that can be used to support some of the costs associated with the project. This might include:

- the engagement of a consultant to provide expertise in some aspect of the enquiry;
- supply cover costs to facilitate shared in-school or in-classroom working;
- venue and refreshment costs;
- transport to meetings
- the purchase of materials to support teachers in working on the chosen issue.

At the outset we will expect to have a broad indication of how the funding will be used and the final report should include information regarding the categories of spend.

What other support will there be?

In addition to the financial help outlined above, FMKNs will also have the support of their FMSP Area Coordinator, the FMSP central team and the NCETM regional coordinator. It is hoped that participants will also support each other by joining and participating in the NCETM AS/A Level Further Mathematics Forum.

What are the criteria for selection?

Successful applicants will indicate clearly that they can work with colleagues to meet the expectations for developing an FMKN. They will outline a vision of what they hope to achieve for the teachers and schools/colleges involved, whilst remaining flexible enough to respond to the needs of the teachers who become involved in the FMKN.

How do I get involved?

If you are interested in starting a FMKN you will need to:

- Contact your local FMSP Area Coordinator, who must support your application;
- Consider how your network will run;
- Complete and return the application form

We will contact all applications to let them know the outcome of their application.

What are the copyright issues on the project outcomes?

The outputs of the action research projects will be the intellectual property of the NCETM and FMSP and may be published on the NCETM web portal and FMSP website and be subject to wider dissemination.