

Improving Science From Within

A proposal for a “Science Advisory Group” and model for “Peer Enquiry and Self-Development”

Summary

While schools are still being supported in secondary science by Bedford BC through National Strategy funding, this paper looks ahead to the changing face of Continuous Professional Development (CPD) expectations and funding – and shifts the emphasis of the current model of ‘external support’ to one of ‘communal responsibility and self-support’. At this stage, flexibility in any model is essential and it will likely change if developed further. What is proposed here centres on secondary science and in the first instance is restricted to Upper Schools. If, after suitable pilots and trial periods, the model is deemed successful, it could be scaled up into Middles, Lower, Specials or others areas of the school curriculum.

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Main messages

- **Self-support:** In what is proposed, higher- and lower-achieving science departments can systematically learn from **all other** departments to achieve a step-change in science teaching and learning – with **every** school sharing what they do well. It helps move all schools from a dependence/external support approach and towards an inter-dependence/self-development approach, and involves more use of science teachers in schools and less use of LA-based staff. It provides greater opportunities for staff from all schools to work on opportunities and issues – CPD for both the supporting and supported staff, to help retain staff and provide a step-up in their career path.
- **Greater communal responsibility:** It allows science departments to start to share responsibility for the Bedford community’s young people who are learning science across the different schools, using the notion of a peer ‘enquiry’ by other science teachers. It builds leadership capacity in science staff, and also develops capacity for school self-improvement by empowering Senior Leadership Team (SLT) science line managers to help initiate and drive developments with their science colleagues.

Case study

Bedford Borough School Improvement Team is preparing to embrace the new 2011 arrangements and at the same time improve outcomes for learners and the quality of provision. It faces, like all Local Authority’s, the problem of uncertainty about the future and the real concern that without a team of professionals schools and School Improvement Partners will not be in a strong enough position to assist schools in raising performance.

The Local Authority has developed a ‘school subject peer enquiry and self development process’ in the area of science to test the feasibility of such an approach to this as a future School Improvement Model.

Key outcomes

The introduction of this process has already attracted four schools in 2009/10. The scheme is deemed successful by both the participating schools and the School Improvement team. The benefits that have been realised in this year have been:

- Improvements in teaching and learning in participating schools at no additional resource levels.
- Raising of outcomes for learners
- A self sustaining community of science teachers has been established
- Full engagement of Professional Support Group
- Replacement of full-time Science Strand Leader with a team of self supporting professionals led by a current practitioner.

Learning

The quality of the lead professional has been a critical factor in the success of the programme thus far. The support of senior leadership teams has also been needed to ensure the programme is embedded in school. The continued support of SLT will be needed on this model to spread to other curriculum areas and to other phases.

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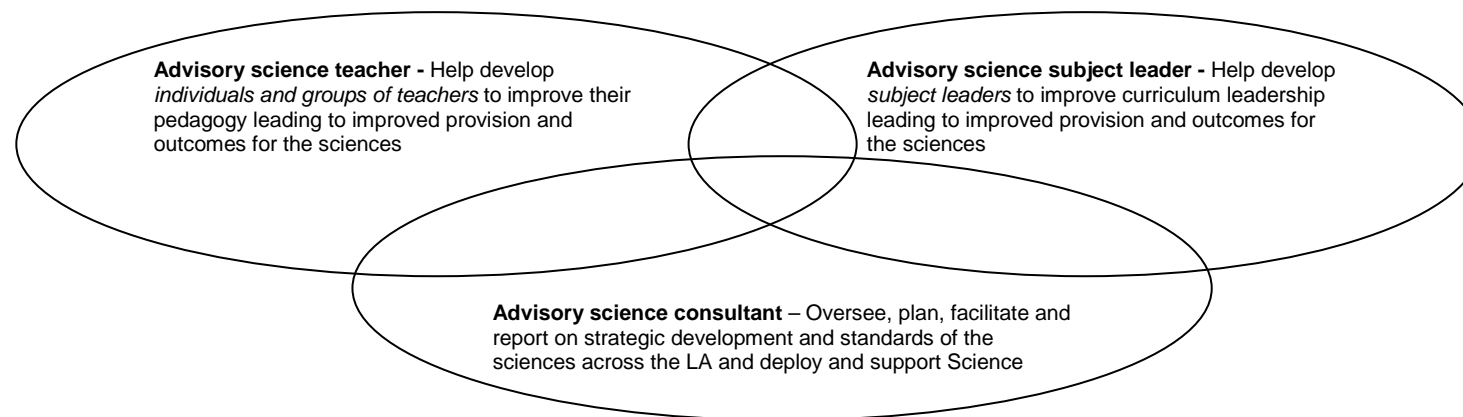
Additional information

1 **Science Advisory Group (in place of National Strategy consultancy)**

Overall Science Advisory Group purpose

- To maintain and/or raise standards and outcomes for learners in the sciences
- To maintain and/or improve the quality of provision for the sciences – in and out of classrooms, in science departments, in schools' curricula
- To develop a self-evaluative, self-developmental and self-sustaining community of science teachers across an LA
- To strengthen schools' ability to self-manage improvements in science through empowering SLT science line managers

Science Advisory Group - comprises **Advisory science teacher(s)**, **Advisory science subject leader(s)**, **Advisory science consultant**



**Roles currently carried out by science consultants/advisers in LAs and through the National Strategies
- here allocated to Science Advisory Group participants**

Role	Advisory science teacher(s)	Advisory science subject leader(s)	Advisory science consultant
Aspect Leadership and management of science development within the LA	<ul style="list-style-type: none"> ▪ Contribute to the LA science plan, and respond to request from the Advisory science consultant as needed ▪ Co-develop necessary protocols for the work of the Advisory science teacher(s), Advisory science subject leader(s) and Advisory science consultant ▪ Help identify and recruit potential Science Advisory Group participants 	<ul style="list-style-type: none"> ▪ Contribute to the LA science plan, and respond to request from the Advisory science consultant as needed ▪ Co-develop necessary protocols for the work of the Advisory science teacher(s), Advisory science subject leader(s) and Advisory science consultant ▪ Help identify and recruit potential Science Advisory Group participants 	<ul style="list-style-type: none"> ▪ Ensure success of the school support model for science while leading the implementation of any LA science plans ▪ Contribute to the LA school improvement plan and ensure consistency of the science plan within the LA plan ▪ Deploy Advisory science subject leader(s) and Advisory science teacher(s) ▪ Liaise with organisations external to the LA on science and related areas (such as Science Learning Centres, National Strategy Regional Advisers or similar) ▪ Co-develop necessary protocols for the work of the Advisory science teacher(s), Advisory science subject leader(s) and Advisory science consultant ▪ Help identify and recruit potential science development group participants
Professional development, support and capacity building	<ul style="list-style-type: none"> ▪ Contribute to writing support 'contracts' with schools and support as needed ▪ Be involved in coaching teachers ▪ Be involved in planning, teaching and evaluating lessons ▪ Work with teachers (& subject leaders and senior managers) to implement the LA plan for science ▪ Contribute to good practice and capacity-building activities, such as PSG network groups ▪ Support teachers after centralised and in-school science meetings and training 	<ul style="list-style-type: none"> ▪ Contribute to writing support 'contracts' with schools and support as needed ▪ Be involved in coaching teachers and subject leaders ▪ Be involved in observing and providing feedback to teachers in lessons ▪ Be involved in medium and longer term curriculum and dept planning ▪ Work with subject leaders (& teachers and senior managers) to implement the LA plan for science ▪ Work with subject leaders to identify clear priorities which will have a direct impact on raising attainment ▪ Contribute to good practice and capacity-building activities, such as 	<ul style="list-style-type: none"> ▪ Work with subject leaders and senior managers (& teachers) to implement the LA plan for science ▪ Plan and deliver regular and occasional centralised science meetings and training ▪ Lead and contribute to good practice and capacity-building activities, such as network groups ▪ Agree support 'contracts' with schools and support as needed. ▪ Be involved in observing and providing feedback to teachers in lessons ▪ Be involved in medium and longer term curriculum and dept planning

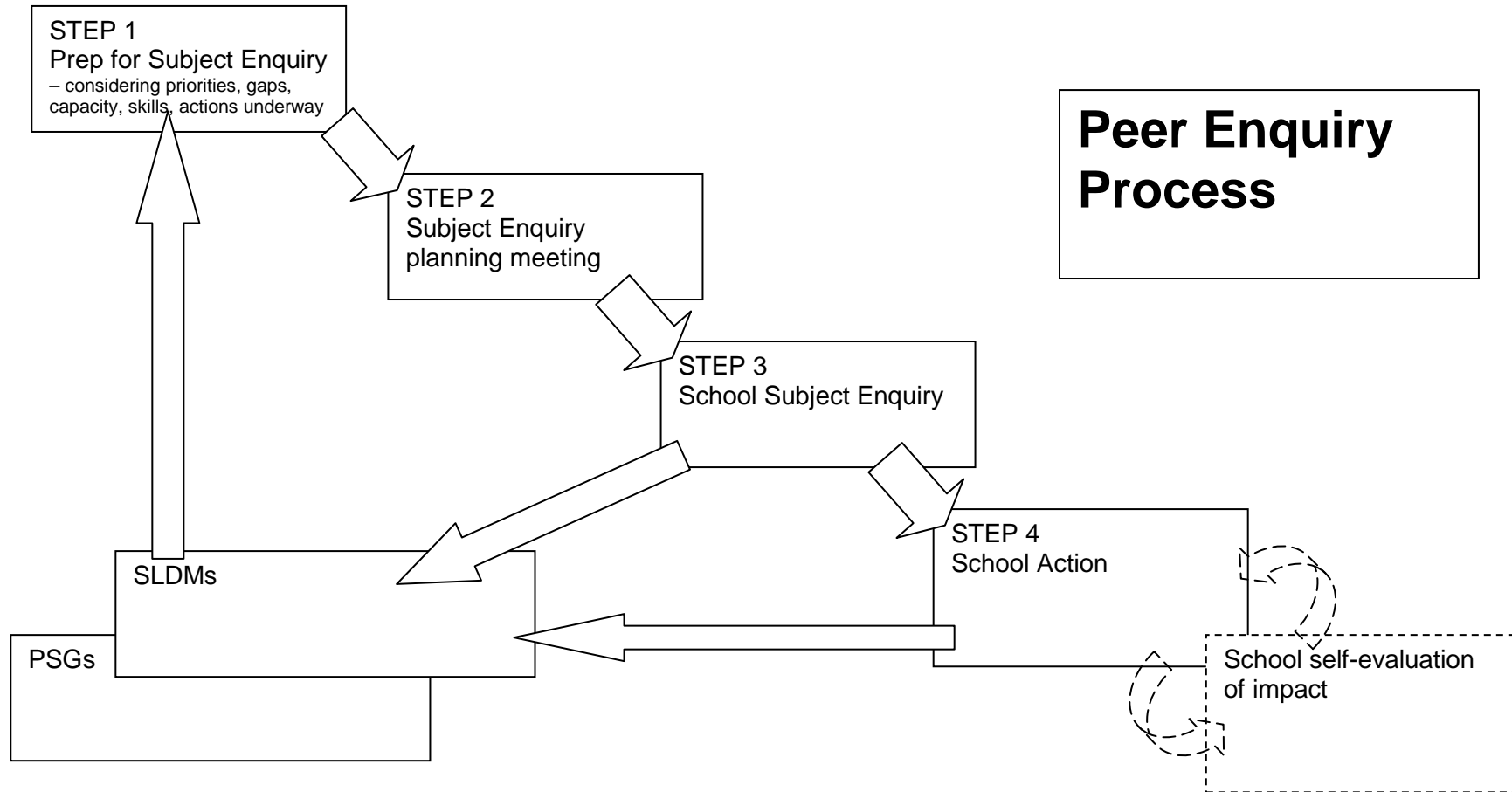
		<p>PSG network groups</p> <ul style="list-style-type: none"> ▪ Work with the Advisory science consultant to plan and deliver regular and occasional centralised and in-school science meetings and training, and support teachers afterwards 	
<p>Monitoring evaluation and QA of science support</p>	<ul style="list-style-type: none"> ▪ Monitor and evaluate the impact of their own work ▪ Contribute to the monitoring and evaluation of the LA plans for science ▪ Help those being supported monitor and evaluate the impact of their own work ▪ Analyse data to identify trends over time, added value and the performance of different groups of pupils ▪ Work with teachers to scrutinise pupils' work and teachers planning ▪ Take part in Peer Enquiries in school science departments, if needed ▪ Support teachers to use pupil progress and performance data to inform their teaching 	<ul style="list-style-type: none"> ▪ Monitor and evaluate the impact of their own work ▪ Contribute to the monitoring and evaluation of the implementation of LA plans for science ▪ Help those being supported monitor and evaluate the impact of their own work ▪ Help subject leaders carry out departmental enquiries/audits in to the provision for science ▪ Support Subject Leaders to analyse pupil progress and performance data to identify trends over time, added value and the performance of different groups of pupils ▪ Work with teachers to scrutinise pupils' work, and whole-department as well as individual teachers planning ▪ Take part in Peer Enquiries in school science departments, if needed 	<ul style="list-style-type: none"> ▪ 'Chair' the Peer Enquiries in school science departments ▪ Analyse data relevant to performance in science to identify trends over time, added value and the performance of different groups of pupils ▪ Monitor and evaluate the impact of their own work ▪ With schools, identify additional support needs ▪ Collate information and report on the monitoring and evaluation of science ▪ Quality assure science support through support for Advisory Science Teacher(s) and Advisory Science Subject Leader(s) with monitoring and evaluation of the impact of their work ▪ Work with Advisory Science Teacher(s) and Advisory Science Subject Leader(s) to support subject leaders in carrying out departmental enquiries/audits in to the provision for science ▪ Support Advisory Science Teacher(s) and Advisory Science Subject Leader(s) in their work with teachers to scrutinise pupils' work and departmental and teachers planning ▪ Provide regular evaluative feedback to the LA on all aspects of science provision in Bedford Borough upper schools

Staffing the roles – potential participants in the Science Advisory Group

Role	Likely background/experience	May suit...	Suggested per week although time could be 'batched' up
Advisory science teacher(s)	Science teaching – from within the LA's schools ¹	<ul style="list-style-type: none"> ▪ AST, 'Excellent' or highly performing teachers ▪ Subject or Keystage Leaders ▪ Science consultants ▪ T&L coaches - or aspiring	1 or 2 days 'ring-fenced' by their school
Advisory science subject leader(s)	Science teaching and subject leadership – from within the LA's schools ²	<ul style="list-style-type: none"> ▪ Experienced subject leaders ▪ Science consultants ▪ School leaders (with science SL experience and/or experience in science line management) - or aspiring (e.g. 2nd in Science ³)	1 or 2 days 'ring-fenced' by their school
Advisory science consultant	Education consultancy and/or school improvement; science subject leadership and science teaching – with a background external/at a professional 'distance' to the LA's schools	<ul style="list-style-type: none"> ▪ Advisers, inspectors or consultants (from within LA or external) ▪ School leaders (with science subject experience and/or experience in science line management) – but not working in the LA schools ▪ Experienced AST (with science subject experience and/or experience in science line management) – but not working in the LA schools ▪ Other science ITT tutors, CPD providers etc - or aspiring.	1 or 2 days

¹ and ² : The Advisory Science Teacher and Advisory Science Subject Leader could be on a yearly release from the LA's schools, and the roles rotated and thus drawing from a range of schools. If the model were to be rolled out across other subjects, opportunities might exist to share Advisory Subject Teachers and Advisory subject leaders across subjects.

³ : This would be good CPD for a Subject Leader or 2nd in Science to undertake this role. In addition, if the Subject Leader undertakes the role, it is good 'succession-planning' CPD for a 2nd in Science to back-fill when Subject Leader is not in school.



2 ***School Subject Peer Enquiry and Self-Development Process***

In essence, a Peer Enquiry is a focus on the pupils and investigating the factors that hold back or enable learning. As such, it is a developmental process designed to support departmental self-evaluation and improvement in planning – as *distinct from* a departmental performance review designed to make a judgement about a department’s performance at a fixed point in time.

- **Why is it called “Peer” Enquiry?**
Each school’s Science Subject Leader will also be involved in identifying issues/observing/supporting/advising during a Peer Enquiry at another school, just before their own Peer Enquiry takes place. This establishes a ‘chain’ of enquiries as each school’s Science Subject Leader is involved in the previous enquiry in the chain. There could be more than 1 chain operating at a time.
- **How often would it happen?**
Frequency: 1 enquiry per year per school – spread evenly throughout the school year. Each Subject Leader is involved in their Enquiry plus one other – perhaps committing approx. two days/year to this process.
- **Who is involved?**
Involves the school’s Science Subject Leader, the next school’s Science Subject Leader, as a key staff - and the Science Advisory Consultant as coordinator/chair - although these could be reduced and roles adjusted once staff are experienced. Also involves school SLT directly in review process to empower line management to secure subsequent impact.
- **What training may be required?**
Initially training would be needed in carrying out the enquiry process in schools – and could happen through SLDMs in the run up to the launch of the system getting underway

Abbreviations used below:

Advisory science teacher(s)	Adv Sc T
Advisory science subject leader(s)	Adv Sc SL
Advisory science consultant	Adv Cons
Science Subject Leader at the school undergoing the enquiry	Sch Sc SL
Science Line Manager (SLT) at the school undergoing the enquiry	Sch Sc Line Mgr
Science Subject Leader at the next school to undergo an enquiry	Next Sch Sc SL
Science Subject Leaders Development Meetings	SLDM
Professional Study Group	PSG

Step	Action	Involved	Process	Input	Output 1	Output 2
1	Preparation for Peer Enquiry - considering priorities, gaps, capacity, skills, actions underway etc.	<ul style="list-style-type: none"> Adv Cons 	<ul style="list-style-type: none"> Desk review Email etc (Could be undertaken at previous SLDM?) <p>~Half day?</p>	<ul style="list-style-type: none"> LA or other overarching priorities for science Identified likely issues suggested at previous SLDMs and PSGs Dept SEF or equivalent Any available data – to identify gaps in performance Dept action plans Consideration of what skills and experience the Next Sch SL will bring School suggestions for lines of enquiry⁴ 	<ul style="list-style-type: none"> Development of possible lines of enquiry Dates agreed and arrangements made 	
2	Peer Enquiry planning	<ul style="list-style-type: none"> Adv Cons Sch Sc SL (or delegate) Next Sch SL (observer/support) (or delegate) Sch SLT line manager <p>If appropriate:</p> <ul style="list-style-type: none"> Adv Sc SL Adv Sc T 	<ul style="list-style-type: none"> Meeting at school <p>~Twilight meeting or by email?</p>	<ul style="list-style-type: none"> Possible lines of enquiry Dept SEF or equivalent Any available data Dept action plans 	<ul style="list-style-type: none"> Agreed lines of enquiry Plans for Peer Enquiry in place Protocols agreed 	

⁴ This could take the form of “Two wishes and a star” e.g. “We would be interested in feedback and advice on how we might improve (1) Boys attitudes to GCSE coursework and (2) Integration of APP into Y9 Schemes. We hope to be able to show our success in reducing AS-A2 drop out in the sciences by our enrichment activities in Y12.”

3	School Peer Enquiry	<ul style="list-style-type: none"> ▪ Adv Cons ▪ Sch Sc SL (or delegate) ▪ Next Sch SL (observer/support) (or delegate) ▪ Sch Sc Line Mgr (Active participant in review) <p>If appropriate:</p> <ul style="list-style-type: none"> ▪ Adv Sc SL ▪ Adv Sc T 	<ul style="list-style-type: none"> ▪ Developmental lesson observations (based on 'learning walk' model not inspection) ▪ Interviews teachers/pupils ▪ Misc. meetings ▪ Review meeting (Adv Cons to chair) <p><i>Max 1 school day + twilight meeting but dependent on line of enquiry – and could be split over >1 day</i></p>	<ul style="list-style-type: none"> ▪ Lessons ▪ Pupil voice – interview/questionnaire ▪ Evidence from pupils work ▪ Any available attainment and progress data ▪ Teachers and other staff 	<ul style="list-style-type: none"> ▪ As chair, Adv Cons reports (1 page max) on summary of findings⁵ and actions as agreed at review meeting (could delegate reporting to Adv Sc SL if present). Any additional findings supplementary to the lines of enquiry also included if needed. ▪ Feedback of findings to dept at next dept mtg - SLT line manager to be present ▪ Sch Sc SL – Dept SEF and action plans confirmed or amended 	<ul style="list-style-type: none"> ▪ Use by Science Advisory Group to prioritise PSG/SLDM sessions ▪ Informs evaluation of provision for science across LA.
4	School Action and school self-evaluation of impact	<ul style="list-style-type: none"> ▪ See footnote⁶ ▪ Sch Sc SL ▪ Sch Sc Line Mgr (oversee) <p><u>Bought in or loaned-in as needed</u></p> <ul style="list-style-type: none"> ▪ Other school staff ▪ External providers ▪ Adv Sc SL ▪ Adv Sc T ▪ Adv Cons 	<ul style="list-style-type: none"> ▪ CPD ▪ Coaching ▪ Intervention ▪ Advice ▪ etc <ul style="list-style-type: none"> ▪ Usual dept SEF processes 	<ul style="list-style-type: none"> ▪ Peer Enquiry report ▪ SEF/Action plans ▪ etc 	<ul style="list-style-type: none"> ▪ Improvements in provision and standards for science 	
Repeat at next school with a later school Sch Sc SL as observer/support ... And so on...						

⁵ This could take the form of “A star and two wishes” e.g. “The Peer Enquiry has confirmed the success in reducing AS-A2 drop out in the sciences for these reasons <comments>... It has been agreed that (1) Boys attitudes to GCSE coursework could be improved by <action>.... and (2) APP can be further integrated into Y9 Schemes by <action>...”

⁶ While the Peer Enquiry is a universal offer of support, the school itself is responsible for any subsequent actions and (post-National Strategies) may not expect support from the LA as a result of the Peer Enquiry. Post-National Strategies, while the LA may be able to provide support on a loan or buy-in basis from Science Advisory Group members (two of which are from other LA schools), schools will still need to support internally, and buy-in from external providers and other schools (from within the LA or elsewhere).

Science Subject Leaders Development Meetings (SLDM) and Professional Study Groups (PSG)

Term 1 ⁷	Before next term's SLDM...? ⁸	Term 2	Before next term's SLDM...?	Term 3	
(am) SLDM and networking – run by one or all of Science Advisory Group	(Could be half day or twilight) PSG on issues identified in Peer Enquiries – could be run by Adv Sc SL and/or Adv Sc T	(am) SLDM and networking – run by one or all of Science Advisory Group	(Could be half day or twilight) PSG on issues identified in Peer Enquiries – could be run by Adv Sc SL and/or Adv Sc T	(am) SLDM and networking – run by one or all of Science Advisory Group	And so on...
(pm) Developing solutions session Small groups focus on issues identified in Peer Enquiries since last meeting – run by one or all of Science Advisory Group		(pm) Developing solutions session Small groups focus on issues identified in Peer Enquiries since last meeting – run by one or all of Science Advisory Group		(pm) Developing solutions session Small groups focus on issues identified in Peer Enquiries since last meeting – run by one or all of Science Advisory Group	

⁷ SLDMs could be less frequent (twice yearly?) due to expectation of Subject Leader involvement in their own and one other Peer Enquiry.

⁸ PSGs frequency would depend on identified needs and capacity.