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Please note this document is designed to be bound along the long edge.

ENQUIRING MINDS

"We want them to be able to pursue independent enquiry in whatever subject, in whatever discipline, whether it's in school or not. We want to get them excited about learning."

Teacher

"It's sort of like your own lesson where you teach yourself by doing things... It's a bit like teaching yourself to work individually."

Student

This guide seeks to present a vision of how learning might be, and at the same time provide ideas about how that vision might be realised in practice.

ENQUIRING MINDS

John Morgan, Ben Williamson, Tash Lee, Keri Facer, Futurelab

We have provided these spaces to allow readers to jot down their thoughts and questions as they read

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ACKNOWLEDGEMENTS

This guide to Enquiring Minds is the result of research and development work with teachers in two schools since July 2005. We would like to acknowledge and thank the headteachers, Chris Gardner at Ashton Park Community School in Bristol and Graham Silverthorne at Gordano School in Portishead, for their commitment to the project. Thanks also to the teachers who have participated in the development of Enquiring Minds. They are: Graham Allott, Michael Basnett, Tony Lansdowne, Jessica Meyer, Steve Moseley, Andrea Bird, Ross Martland, Peter Morris, Vicky Munday, and Paul Welch.

These teachers have devoted considerable time helping to develop the Enquiring Minds project. They have welcomed us into their lessons as observers, and they have contributed to developing the project's vision in practice. We have also spoken to lots of students from both of the participating schools, allowing us a glimpse into school life from their perspectives, as well as providing us with their views about Enquiring Minds. This guide is informed by our work with these people. It goes without saying that we are fully responsible for its contents; we hope we have done justice to their hard work.

The project is funded by Microsoft's Partners in Learning programme; our thanks to the team there for their support for the project.

Our colleagues at Futurelab have provided invaluable advice, feedback and constructive criticism throughout.

FOREWORD: ABOUT THIS GUIDE

Enquiring Minds is a research and development project exploring questions of educational change. The aim of Enquiring Minds is to enable students to take more responsibility for the content, processes and outcomes of their learning. We believe that students bring to school valid and important knowledge, and the project is an attempt to bring about deeper engagement in learning by starting from students' own interests and needs. For teachers, Enquiring Minds offers the possibility of an extended view of their work as they find ways to respond sensitively and practically to children's lives and existing knowledge.

Enquiring Minds is being developed at a time when there is heightened debate about how the curriculum and schools should be organised. This guide provides an account of what is distinctive about the Enquiring Minds approach, arguments about why schools and teachers should develop the approach in schools, and guidance as to how it can be developed. We start from the assumption that sustainable change in schools happens though the principled thinking and practices of teachers rather than through the imposition of external models.

It is our view that schools should be places where students have a voice in determining how their learning is organised and experienced, and that the content of learning should be negotiated with students. This guide should be used as a point of departure for schools and teachers who wish to travel in similar directions. Although the research focus has, to date, been on Key Stage 3, some people have suggested that it be used with older or younger students and we would be interested to hear how teachers and schools use the guide. This guide is supported by the research evidence which is published alongside it at www.enquiringminds.org.uk.

The writing of this guide is based on the practices of teachers and students. At the same time, we are not claiming that this is the final word on Enquiring Minds. Indeed, we are aware that the 'vision' of Enquiring Minds as set out at the start of this section has not yet been achieved in the two schools that we have been working with. This is because the changes needed to bring about the type of student-led enquiry we seek require far-reaching changes in school culture, ways of thinking about teaching and learning, and teacher-student relations. This guide seeks to present a vision of how learning might be, and at the same time provide ideas about how that vision might be realised in practice.

John Morgan, Ben Williamson, Tash Lee, Keri Facer, Futurelab
October 2007

"Most of the school curriculum is what we want them to learn, which is fine but it maybe doesn't tap into what they want to learn, or tap into their own interests, or things that they value as important."

Teacher

"It's about doing what you're interested in, researching what you want about what you like."

Student

INTRODUCTION FROM MICROSOFT

You might be asking yourself why a technology company is involved with an initiative like Enquiring Minds.

At Microsoft, we don't believe in technology for technology's sake. Instead, we see what we do as a powerful catalyst for helping people – both young and old – to realise their full potential, whether at school, at work or in the home. This is essentially the spirit of Enquiring Minds.

Right now, UK education is both an exciting and challenging place to be. There is a force for change which is driving a fundamental re-think of the traditional learning environment, teaching practices, curriculum and assessment. Technology has a major role to play as a facilitator in this process; as such, we are working in partnership with many schools, teachers and students to support transformation where we can.

Innovation is pivotal to what we do, which is why Microsoft is particularly proud to support projects such as Enquiring Minds. Finding new ways to nurture independent and creative thinkers is a key part of preparing children for life, work and play in today's changing society.

The contents of this guide are the result of shared activities between Futurelab, teachers and students. In addition to placing the pupil at the centre of the learning experience, Enquiring Minds can also help foster the skills required for lifelong learning. We hope it inspires you introduce some of the Enquiring Minds principles in your own classroom.

Steve Beswick
Director for Education, Microsoft UK

01

Enquiring Minds is a distinctive approach to teaching and learning which takes seriously the knowledge, ideas, interests and skills that students bring into schools.

WHAT IS ENQUIRING MINDS?

WHAT IS ENQUIRING MINDS?

Enquiring Minds is...

a response to the challenges schools face in the task of preparing children for a future characterised by rapid social, technological and cultural change.

Enquiring Minds is...

a distinctive approach to teaching and learning which takes seriously the knowledge, ideas, interests and skills that students bring into schools.

Enquiring Minds is...

a set of principles to underpin relationships between adults and children in schools and classrooms, which see children taking increasing responsibility for determining the content and purpose of their learning.

Enquiring Minds is...

a set of print and digital tools to support teachers and school leaders to implement, adapt and explore Enquiring Minds approaches.

Enquiring Minds is...

a three-year programme of research testing these approaches, principles and resources in UK schools.

Enquiring Minds aims to support students to be...

- inquisitive and curious about things that they experience in their everyday lives
- able to pose problems, ask questions, and recognise issues that they would like to explore
- able to develop an understanding that all knowledge changes over time as people challenge, shape and contribute to it
- confident that they too can challenge, shape and contribute to knowledge
- aware that there are always multiple perspectives for looking at, analysing and understanding things
- able to propose solutions to problems and questions, and to know how to pursue these solutions.

Enquiring Minds is not...

- a new name for thinking skills or learning to learn approaches
- a return to the child-centred permissive education of the 1970s
- a special programme for gifted and talented or disaffected children.

If you are still interested... read on.


FLIPCHART

02

The relationship between pedagogy and curriculum and between 'school' knowledge and students' 'informal' knowledge is central to the search for more effective and powerful educational strategies for the 21st century. This section establishes Enquiring Minds in current educational debates.

INTRODUCTION

THE CURRENT PROBLEMS

Today, there is intense debate about the type of education system required to prepare young people for the 21st century. A wide range of commentators, from very different political positions, make the case that while the social and cultural experiences of children and wider society have dramatically transformed over the past 50 years, schools have failed to keep pace with this change. Some commentators point out that the classrooms of today would be easily recognisable to the pioneers of public education of the 1860s: the ways in which teaching and learning are organised, the kinds of skills and knowledge that are valued in assessment, and a good deal of the actual curriculum content, have changed only superficially since that time. In the light of these arguments, there is now an intense focus on how schools can develop the kinds of educational experience appropriate for young people growing up in the 21st century.[01]

This focus, in recent years, has often centred on questions of pedagogy and the development of new approaches to supporting effective, creative or personalised learning. There is an increasing interest in understanding the 'science' of effective or evidence-based teaching: in understanding what teachers must do to teach effectively.[02] At the same time, there is an increasing interest in supporting students to develop thinking skills and to focus on learning how to learn: to understand what students must do to learn effectively.[03] In parallel, we have seen the emergence of certain ideas of personalised learning, which promote the tailoring of teaching approaches to fit individual students' learning preferences.[04] All of these debates suggest a renewed and important attention to the processes by which children can be enabled and supported to learn today.

However, some caution is required, since in much of this work the question of **what** is learned – the knowledge that makes for learning – is rarely discussed. Little is said, in these debates, about the content that students are supposed to learn or about the ends to which such capacity to learn is to be directed.[05] The question of curriculum is often seen as separate from debates on how to improve pedagogy.[06]

This is a surprising oversight. For, after all, if we are interested in supporting young people to develop as learners, to nurture thinking skills, to develop creative and responsive capacities to engage with the world, then the question of curriculum and how it is negotiated and constructed cannot be overlooked.

01 For a representative sample of academic writing see: Bentley, T (1998) Learning Beyond the Classroom (Demos); Brown, P and Lauder, H (2001) Capitalism and Social Progress: The Future of Society in a Global Economy (Palgrave Macmillan); Hartley, D (1997) Reschooling Society (The Falmer Press); Cope, B and Kalantzis, M (eds) (2000) Multiliteracies (Routledge). For reflections of these debates in policy terms see ATL (2007) Subject to Change: New Thinking on the Curriculum (Association of Teachers and Lecturers); QCA (2004) Futures: Meeting the Challenge (www.qca.org.uk/qca_6073.aspx).

02 See, for example: Muijs, D and Reynolds, D (2001) Effective Teaching: Evidence and Practice (Paul Chapman); Petty, G (2006) Evidence-based Teaching: A Practical Approach (Nelson Thornes).

03 See, for example: Claxton, G (2002) Building Learning Power (TLO); Watkins, C (2005) Classrooms as Learning Communities: What's in it for Schools? (Routledge); Watkins, C, Carnell, E and Lodge, C (2007) Effective Learning in Classrooms (Paul Chapman). For a review of the literature on thinking skills, see McGregor, D (2007) Developing Thinking, Developing Learning (McGraw-Hill).

04 What 'personalisation' actually means is open to interpretation. Leadbeater, C (2004) Learning About Personalisation (DfES/Demos) is widely seen as the key statement, and his ideas are picked up in the Gilbert Review on Learning 2020. Campbell et al (2007) Personalised learning: ambiguities in theory and practice, British Journal of Educational Studies, 55(2), 135-154, provide a critical assessment which highlights the barriers to 'deep personalisation', whilst Fielding, M (2006) 'Leadership, personalisation, and high performance schooling: naming the new totalitarianism', School Leadership and Management, 26(4), 347-69, is particularly scathing, associating personalisation with the 'new totalitarianism'.

05 As John White memorably remarked about the current vogue to teach thinking skills, children need something to think about. White, J (2002) The Child's Mind (Routledge).

06 Moore, A (2004) Teaching and Learning: Pedagogy, Curriculum and Culture (Routledge Falmer) is a notable exception. Scott, D (2008) Critical Essays on Major Curriculum Theorists (Routledge) provides critical readings of a range of theorists and assesses their implications for curriculum development.

Surely, therefore, if we are asking students to be more and more self-aware about **how** they learn, then a core component of that exercise is to enable them to engage fully with **what** it is that is being taught. Our attention needs to be drawn not only to students' learning processes but to the relationship between this and **what** they are learning.

And yet the formal programmes of study in the National Curriculum and how they are 'delivered' serves to exclude many students. Their emphasis on what is often seen as 'proper knowledge' privileges abstract and theoretical knowledge that is often divorced from the everyday worlds, concerns, needs and experiences of learners.[07] And so, many students will happily consume what they are taught; others will mark time and pass their exams; some will struggle; some will resist.[08] Despite high quality teaching, the extent to which 'school knowledge' is felt to be meaningful or useful to even the most academically gifted is an open question. What is in doubt is the extent to which students are fully engaged in developing their capacity to learn through activities which are of relevance to them.

In the past, one way of altering the curricular experience has been to make it more meaningful or 'relevant' to students by offering vocational courses, particularly for those students with less academic abilities. Such a response, however, runs the risk of restricting students to a narrow set of future opportunities.[09] It also equates 'relevance' with economic or workplace activities rather than, for example, the possibility of young people being engaged, challenged and excited by a range of more creative, expressive, reflective or emotionally-based activities.[10]

Another approach is to explore the potential for students' own experiences, interests, concerns and lives to act as the starting point for creating a meaningful, relevant and engaging curriculum for young people. What has been ignored in debates on the development of effective pedagogy has been the question of how learning is intimately tied up with the question of knowledge, of how we address the questions: Learning what? For whom? And why?

The relationship between pedagogy and curriculum and between 'school' knowledge and students' 'informal' knowledge is central to the search for more effective and powerful educational strategies for the 21st century. It is these relationships that Enquiring Minds is specifically addressing.

07 These arguments pre-date the National Curriculum. Notably, the 1970s was a period in which many curriculum thinkers and teachers were questioning the relevance of the 'traditional' curriculum for students growing up in a period of rapid social change,

08 Paul Willis's classic study is the obvious example here. Willis, P (1977) Learning to Labour: How Working Class Kids Get Working Class Jobs (Saxon House). There is a whole set of writing in the field of cultural studies that explored the mismatch between the formal cultures of the school and the informal cultures of young (especially working class) people. See for example: Bates, I et al (1984) Schooling for the Dole? The New Vocationalism (Macmillan); and Hollands, R (1990) The Long Transition (Macmillan).

09 This argument, and its implications, is developed by Hatcher, R (2000) 'Social class and school: relationships to knowledge' in M Cole (ed) Education, Equality and Human Rights (Routledge).

10 There is a growing literature on the role of creativity in education. The best policy statement comes from NAACE, and Craft provides further analysis. See: NAACE (1999) All our Futures: Creativity, Culture and Education (DfEE); Craft, A (2005) Creativity in Schools: Tensions and Dilemmas (Routledge).

THE ENQUIRING MINDS VISION

This guide develops a vision for how school might be if more responsibility for deciding on the content of lessons was given to students. By endorsing this view we are not favouring a 'de-schooling' agenda. We are not suggesting just 'letting the kids get on with it'; that seems to us unacceptable and unlikely to result in empowerment for young people. Instead, we propose a vision for meaningful learning that starts from a principle of making visible and valuing students' own ideas, interests and concerns, and for meaningful teaching which expands and extends from there.

It is important to stress, however, that students' experience and ideas are just the starting point. In order for learning to be truly educational, the experiences and ideas that students bring to the classroom need to be viewed from different angles and different perspectives; students need to be supported to be curious about, to challenge, and to enquire into their experiences, interests, assumptions and aspirations. As such, Enquiring Minds proposes a 'problem-posing' approach to teaching and learning.[11]

Starting off from students' ideas, interests and concerns, then, means finding ways of supporting them to encounter knowledge that they did not possess before. This knowledge may come from diverse sources – from the National Curriculum, from students' own experiences, from new sources outside the classroom. The object of the initiative is for students to engage with 'really useful knowledge' and to explore how knowledge is built, is changed, and develops over time. At the same time, starting from students' ideas and experiences also means finding ways of supporting them to acquire skills that were previously undeveloped. Education, after all, is concerned with making available to learners the opportunity to master a range of systematic ways of understanding and engaging with the world that they cannot be presumed to encounter elsewhere.

The teacher's role in Enquiring Minds, therefore, is to enable students to engage with the world around them in deeper and more complex ways.

Starting off from students' ideas, interests and concerns, means finding ways of supporting them to encounter knowledge that they did not possess before

[11] The idea of 'problem-posing' is a powerful idea associated with the work of the Brazilian educator Paulo Freire. In contrast to problem-solving, it seeks to ask questions about how the world came to be organised in this way and how it might be organised differently. See Freire, P (1972) Pedagogy of the Oppressed (Penguin).

As we have learned through the Enquiring Minds research programme, managing the transition from National Curriculum approaches to a more student-directed form of teaching and learning is far from easy. For both students and teachers it can prove more challenging than the usual classroom routines. Some students' expectations about how schools operate – that teachers 'deliver content' and students 'acquire content' – are likely to have hardened, and encouraging them to be more proactive may take time. Additionally, it may be quite difficult for teachers to get to grips with their students' out-of-school experiences and values, and to see how these might be used as fertile sources and resources for learning.[12] Students themselves may feel that their social and cultural lives are quite restricted, or may resist the idea of sharing aspects of their social lives and the informal knowledge they have developed there in a school setting.

Despite these challenges, Enquiring Minds seeks to take seriously the proposition that students' interests, experiences and ideas are important 'living curricula' worth exploring in depth and which yield powerful and important activities for both students and teachers. Some of these activities may comprise engaging with students' day-to-day pressures and anxieties; for others, it may mean paying new attention to apparently trivial concerns or to seemingly esoteric and exotic special interest groups, and for others still, engaging with topical affairs of concern to students, community or country. During the development of the project, we have seen students pursuing enquiry in areas as diverse as child soldiering, medicine, sex, fashion, new technology, animal welfare, and sports. This places new and exciting demands on teachers. On one level it means teachers responding to these interests by locating resources and asking questions, facilitating exchanges and enabling activities that can support students to develop greater understanding and clarity from their initial ideas and enthusiasm. On another level it means that teachers have to understand the ways in which knowledge is produced, work in ways that go beyond their own subject knowledge, and develop ways to engage with students' lives and cultures.

[12] For a thoughtful reflection on these issues, see Richards, C (1992) 'Teaching popular culture' in K Jones (ed) English and the National Curriculum: Cox's Revolution? (Kogan Page). See also Buckingham, D (1998) Teaching Popular Culture: Beyond Radical Pedagogy (UCL Press).

THE ENQUIRING MINDS VISION
Continued

At this point we want to stress that Enquiring Minds is not designed specifically for extremely able students, nor particularly for those at risk of disengaging from the curriculum altogether. We think it should be an entitlement for all students. After all, there is a wealth of evidence that how students receive the curriculum (whether they welcome, accommodate or reject it) is affected by their own cultural experiences. The notion that 'one size fits all' is increasingly questioned. There is a trend towards opening the school curriculum so that students' out-of-school cultures are recognised as valid and worthy of consideration. There is already evidence that this is happening across the curriculum. For example:

- in **Science** there have been moves towards recognising students' own scientific understanding and attempts to recognise popular understandings of science
- in **English** there is a long-standing concern to teach texts that are based on students' own cultural experiences
- in **Geography** there is a growing recognition that children and young people have their own 'personal geographies' and experiences of places and environments
- in **History** there is a growing interest in using local and family histories, as well as increased attention to social and cultural history.

In an age of globalisation, mass migration, rapid technological shifts and climate change, the question of what is to be taught and studied in schools is arguably the most important facing educators. If 'knowledge is power' then, in a knowledge economy, the question of what knowledge is and who gets access to it is of fundamental importance.[13] These questions are at the heart of Enquiring Minds as it seeks to contribute to this ongoing conversation. It seeks to create spaces where children have the chance to enquire as a means of tackling issues, ideas and concerns, and developing knowledge that is meaningful to them, their communities and the wider world.

If 'knowledge is power' then, in a knowledge economy, the question of what knowledge is and who gets access to it is of fundamental importance

[13] The idea that we live in a 'knowledge economy', and that this has profound implications for schools, is becoming increasingly common. A popular statement is found in Thomas Friedman's (2006) The World is Flat: The Globalised World in the Twenty-first Century (Penguin). Like all such grand-level concepts, this requires interrogation. A good starting point is Kenway, J, Bullen, E, Fahey, J & Robb, S (2006) Haunting the Knowledge Economy (Routledge), which suggests that the knowledge economy is not as all-powerful and pervasive as it is often presented.

"Students bring to the classroom a load of stuff teachers don't know, and some of it is very valuable. They bring an awful lot of knowledge into the classroom."

Teacher

"Sometimes you just sort of think, 'Oh what am I going to do now?', but if you actually look at the questions you can think of about a million more to ask."

Student

03

Any educational approach, whether it is made explicit or not, is based on views about the nature of knowledge and curriculum, and the relationship between teachers and students.

This section sets out some of our assumptions and views in these areas, both in order to be transparent about 'where we are coming from', and also because we believe that these underlying ideas are helpful for educators in informing decisions about how to implement or adapt Enquiring Minds approaches in schools.

KEY IDEAS UNDERPINNING ENQUIRING MINDS

VIEWS OF KNOWLEDGE

Knowledge is at the centre of the Enquiring Minds approach. An Enquiring Minds classroom is a classroom in which knowledge is being presented, shared, discussed and critiqued. It is also a democratic but intellectually disciplined classroom in which students and teachers create and re-create knowledge. Central to Enquiring Minds is the principle that young people are able to access, shape and contribute to knowledge, and that this is not an activity to be delayed until children become adults.

It is often argued that schools operate with a 'banking' view of knowledge in which knowledge is 'deposited' in students' minds.[14] Much of this knowledge never gets used and, since it is not meaningfully connected with students' experiences, is quickly forgotten. In an attempt to counter this tendency, others suggest that it might be better to teach students to learn how to learn, so that they are able to 'access' knowledge at the point where it is useful to them.

It is often argued that schools operate with a 'banking' view of knowledge in which knowledge is 'deposited' in students' minds; much of this knowledge never gets used and, since it is not meaningfully connected with students' experiences, is quickly forgotten

The problem with both these views is that they seem to assume that knowledge is simply a stable commodity that is more or less useful at different times. This ignores the fact that knowledge is shaped by human interests and contexts and is, therefore, in itself fluid and subject to change.

Enquiring Minds works on the assumption that knowledge is a social construction. What this means is that knowledge is the product of human activity, and that what counts as knowledge is likely to change. A moment's thought will confirm that what are seen as scientific or historical 'facts' are open to revision, that what counts as valid English language changes over time, that new 'problems' emerge as important at different periods, and that older concepts such as 'economic development' are subject to reinterpretation as society changes.[15]

Far from being static and stored in libraries and databases, knowledge is something that is actively worked on. In a rapidly changing world, therefore, students do not simply need to 'acquire' a fixed body of knowledge, nor do they simply need to learn how to 'find the knowledge' when they need it. Instead they need to be adept in understanding how knowledge changes, how it is formed and developed, in what contexts and situations it is used and produced, and how they themselves may play a role in shaping, changing and working with such knowledge.

This suggests that we need to consider the types of knowledge taught and learned in schools. In thinking about this it is useful to consider three types of knowledge:[16]

[14] This powerful metaphor comes from Paulo Friere's (1972) Pedagogy of the Oppressed (Penguin).

[15] This is, of course, a particular way of thinking about knowledge, and it is one that continues to fuel debates within the sociology of education and curriculum studies. Useful introductions to these debates are found in Moore, R (2004) Education and Society: Issues and Explanations in the Sociology of Education (Polity), and Moore, R & Young, M (2001) 'Knowledge and the curriculum in the sociology of education: towards a reconceptualisation,' British Journal of Sociology of Education 22(4) 445-61. Perhaps more accessible ways into these arguments are provided by the studies by Ivor Goodson into the historical construction of school subjects. For example, see Goodson, I (2005) Learning, Curriculum and Life Politics: The Selected Writing of Ivor F. Goodson (Routledge).

[16] This classification is derived from the work of Lankshear, C (1998) Meanings of 'literacy' in education reform discourse. Educational Theory 48 (3).

Functional – this is knowledge that allows us to operate in the world. It is often technical or 'factual' information. An example would be the knowledge required to read a map to navigate around a town.

Cultural – this is knowledge that is concerned with understanding the meaning of objects or events. An example would be the type of knowledge that allows us to understand why a particular place or landscape is considered valuable.

Critical – this is knowledge that allows us to understand and critique the forces that shape the world. An example would be the type of knowledge that allows students to understand the reasons behind things such as housing shortages or climate change.

All three types of knowledge are required for people to understand the world and operate within it. However, it could be argued that much of what is taught in schools tends to be functional or cultural knowledge which allows people to take their place in the world. Students also need to encounter critical knowledge which allows them to pose questions about how things could be different, and to understand knowledge as dynamic and open to change. It is this critical knowledge that allows people to act to shape themselves and the world.

The dynamism of knowledge is not reflected in the school curriculum, where there is a tendency to present knowledge as 'tidy' and 'packaged'. This is reflected in the metaphor commonly used to describe teaching: that the curriculum is to be 'delivered'.[17] This view of knowledge has little in common with the ways in which knowledge is produced and transformed in reality. The differences between 'school knowledge' and 'dynamic knowledge' are summarised in the following table:

'School' knowledge	'Dynamic' knowledge
Certain	Tentative
Agreed	Often contested
Evidence-base strong	Evidence-base weak
Appears to be largely an individual process	Collaborative in production
Social context appears largely irrelevant	Social context is relevant

Enquiring Minds is an approach to teaching and learning which attempts to model how we might design a curriculum with and for students based on a dynamic model of knowledge.

[17] We are conscious that this is a simplification, and that the content and approach of school subjects may change over time. In general, though, we would argue that school subjects represent quite reified versions of knowledge.

VIEWS OF STUDENTS

Enquiring Minds assumes that students possess valuable knowledge and ideas that they are able to bring into the classroom. Enquiring Minds looks to build upon young people's experiences, ideas, interests and knowledge.

This perspective is based upon significant research in recent decades which has emphasised the importance of schools recognising the cultural experiences of the students they serve. There has been particular focus on young people's experiences and uses of new media and digital technologies outside school, alongside arguments that these are powerful resources, tools and environments for learning informally. Much of this work is oriented around the understanding that young people are active consumers of culture, including the local youth cultures to which they may belong as well as the more wide-ranging media cultures that are accessed via the television, magazines and computers. In short, this work recognises that the informal curriculum taught through media and leisure co-exists (and may sometimes compete) with the formal curriculum of schools.[18]

Many commentators have suggested that media corporations have figured out their own 'pedagogies' and become modern society's best teachers. The corporate curriculum of consumer culture has, in turn, become a yardstick against which the school curriculum and its associated pedagogies are assessed. For example, teachers have increasingly been pressured to embrace new technologies, to make lessons more fun, and to improve the slickness of their presentations.[19] Some people consider this a very good thing: evidence of schools catching up with the demands of their young consumers. However, consumer-media culture teaches particular sorts of knowledge, and these are based on affective pleasures rather than the more reflexive pleasures of knowing about and being able to interpret the world. Being a media consumer is one thing; being an informed and critical consumer is another. What we are getting at is that students do possess meaningful knowledge and this needs to be accompanied by the capacity to interpret that knowledge, to identify its origins and its modes of production, and to be able to identify its potential consequences. This does not just mean being able to critique media and consumer outlets, but having the capacity to question all the forms of knowledge they encounter.

The informal curriculum taught through media and leisure co-exists (and may sometimes compete) with the formal curriculum of schools

[18] For a recent, detailed discussion of the relationship between schooling and young people's informal cultures see Buckingham, D (2007) Beyond Technology: Children's Learning in the Age of Digital Culture (Polity).

[19] See, for example: Kenway, J and Bullen, E (2001) Consuming Children: Education-entertainment-advertising (Open University Press); Lankshear, C and Knobel, M (2006) New Literacies: Everyday Practices and Classroom Learning (Open University Press).

Another key framework which informs the thinking behind Enquiring Minds is the 'student voice' agenda, which argues that students should be involved in all aspects of school life. In a limited form, this can refer to students' involvement in staff appointments or as respondents to 'learner surveys'. This approach draws upon the UN Convention on the Rights of the Child and a commitment to consulting young people on decisions about matters which affect them. While student voice work is beginning to make headway in a range of areas of school life, it is more challenging for schools to adopt approaches to student voice which enable students to negotiate with teachers the direction, content and processes of their learning, and to make significant inputs to organisational decision-making.[20]

The key to both of these perspectives is the recognition that students possess certain sorts of knowledge and skills that often go unrecognised and unvalued by schools. At school, it is rare for students to possess any decision-making authority, and their own experiences and knowledge are subordinated to the standardised knowledge base of the curriculum. Young people, depending on their backgrounds, aspirations and past educational experiences, are more or less attuned to the values schools possess, and therefore more or less likely to accept the position that schools put them in as compliant learners.

Rather than seeing students as on the receiving end of curricular knowledge mediated by teachers, such views regard good teaching to be taking place when students are involved in important issues, real-life experiences and the problems of living, when they are actively involved in doing things rather than watching, when they are questioning common-sense and widely-held assumptions, including their own feelings and beliefs, and when they are involved in planning what they do and what outcomes they produce. Of course, making changes along these lines depends on good relationships being fostered between schools and students. Such relationships rely on students feeling they can trust schools to produce conditions in which meaningful and relevant learning activities can occur.

[20] Most of the literature in this area refers to 'student voice' but it is also sometimes known as 'pupil voice' or 'learner voice.' See Rudd, T, Colligan, F & Naik, R (2006) Learner Voice (Futurelab: www.futurelab.org.uk/resources/publications_reports_articles/handbooks/Handbook132), and for a selection of accessible papers on 'student voice' see Fielding, M (ed) (2001). 'Special issue on student voice,' Forum 43 (2) (www.wwwords.co.uk/forum/content/pdfs/43/issue43_2.asp).

TEACHING ENQUIRING MINDS

Enquiring Minds teaching is demanding teaching, going beyond the notion of 'restricted' professionalism ("my job is to teach my subject as well as I can") to an expanded notion of professionalism ("my job is to contribute to a broader concept of the 'public good' and to understand the social and political context of my work as a teacher").[21]

Enquiring Minds is based on the idea of education for empowerment.[22] What we mean by this is that through Enquiring Minds students are able to understand the forces that shape their lives. Empowerment requires knowledge. So teachers who empower students ensure that they have access to knowledge: functional, cultural and, most importantly, critical knowledge. Quite simply, if knowledge is passed on without an examination of how it was constructed, by whom and for what purposes, then students are disempowered. Enquiring Minds classrooms are characterised by a restlessness that results from wanting to know more, and then seeking to take that knowledge apart to see what assumptions it holds about the world and what students can contribute to changing/developing/building on this knowledge. Empowering teaching demands that teachers take seriously students' lives and cultures. If the real experiences of students do not form the basis of study, then enquiry is not student-led.

The 'good' Enquiring Minds teacher therefore has the following characteristics:

- a thorough understanding of how knowledge is produced, and a desire to learn about how ideas and knowledge are produced in subjects other than their own
- an ability to produce knowledge, ie to research topics, to find out, to make connections between ideas
- an understanding of the social context in which she or he is operating
- insights into the lives of students and a willingness to engage with aspects of students' cultures
- an appreciation of critical educational goals and purposes.[23]

Enquiring Minds is based on the idea of education for empowerment

[21] These terms come from Hoyle, E and John, P (1995) Professional Knowledge and Professional Practice (Cassell). There is a large literature on teacher professionalism. Good recent accounts are provided by: Day, C et al (2006) Teachers Matter (McGraw-Hill); Day, C (2004) A Passion for Teaching (Routledge Falmer); and Gleeson, D and Husbands, C (eds) The Performing School: Managing, Teaching and Learning in a Performance Culture (Routledge Falmer).

[22] We are wary of using a term such as this in these post-modern times, when many are suspicious of the possibility of 'empowerment'. See Ellsworth, E (1989) 'Why doesn't this feel empowering? Working through the oppressive myths of critical pedagogy', Harvard Educational Review 59(3), 297-324). Others would question whether it is the role of teachers to seek to empower students. These are, of course, important questions that go to the heart of the purposes of education.

[23] This list is derived from Kincheloe, J and Steinberg, S (1998) Unauthorised Methods (Routledge).

Exposure to this type of teaching can have a profound effect on students' cognition, because it challenges them to develop their enquiry skills to make sense of a complex world. Teachers who possess these characteristics are not prepared to allow theories, ideas and knowledge to go unchallenged.

The process of reaching new understandings of the world is one of co-construction: teachers and students together create knowledge that is personally and socially meaningful. This suggests that the relationships between students and teachers must be predicated on ideas of sharing, trust and reciprocity; in short, the values of democratic classrooms. At each point in their enquiries, students are involved in decisions about how to proceed.[24]

All this means that Enquiring Minds is a challenging approach to teaching and learning, not least because it appears to go against some of the most deeply held beliefs about teaching and learning in our current system. For instance, it questions the ideas that students bring little to the educational encounter and that the role of the teacher is to pass on either (a) the commonly accepted stock of knowledge valued by society or (b) the skills young people need to take their place in the economic system. Although these are important goals, they need to be part of an education that serves to develop students' capacity for democratic deliberation, critical judgement and rational understanding. Underpinning the Enquiring Minds approach is a belief that the challenge teachers face is in connecting with aspects of students' interests and experience, encouraging them to examine those things and better understand the forces that shape their world.

[24] Brundrett, M and Silcock, P (2002) Achieving Competence, Success and Excellence in Teaching (Routledge Falmer) provides a helpful account of the distinction between what they term 'teacher-centred', 'learner-centred' and 'co-constructive' teaching; their account has similarities with the types of learning identified by Watkins, C (2005) Classrooms as Learning Communities; What's in it for Schools? (Routledge).

TEACHING ENQUIRING MINDS
Continued

What we are describing is the change from what some people have called 'transmission' pedagogy to a 'co-constructive' pedagogy (or what we call here an 'enquiry' pedagogy). Transmission pedagogy has a number of features:

- teacher teaches and students are taught
- teacher knows a great deal and students know little
- teacher thinks and students are thought about
- teacher talks and students listen
- teacher chooses and enforces her/his choice and students comply
- teacher chooses the course content and the students adapt and respond to it.

The features of enquiry pedagogy include:

- teacher and students are co-learners
- teacher uses her/his knowledge and understanding to elicit and bring on students' knowledge
- the classroom is a place where teacher and students think together
- teacher and students develop ways to talk together
- students take on more responsibility for how the classroom should be and how learning takes place
- students choose the course content and teachers adapt and respond to it.

The shift to enquiry pedagogy does not represent a clean break from existing principles of effective teaching. Enquiring Minds instead builds on existing good practice. It relies on good interpersonal relationships and mutual respect between teachers and students. This involves being honest, challenging ideas and (where necessary) confronting patterns of behaviour.

The classroom is a place where teacher and students think together

It is important to clarify the difference between Enquiring Minds and other social constructivist approaches to learning. The fundamental difference is that in Enquiring Minds students choose the content and the focus for enquiry and teachers adapt and respond to this. This places knowledge at the centre of the teacher-student relationship and demands that the teacher's role is to advance students' knowledge and understanding. The central tenet of Enquiring Minds is that the development of the curriculum starts with students' interests, ideas and experiences. This requires strategies to make visible students' interests, ideas and experiences as a valid subject for enquiry and to recognise the potential value in them. Some of us do not find this easy in the face of children's cultures that seem dominated by commercialism and celebrity. However, enquiry pedagogy is committed to engaging with and working with students' interests, whatever they may be.

A common misconception about enquiry might be that it involves the teacher setting students off and letting them get on with things. Nothing could be further from the truth. In fact, successful enquiry requires high level skills on the part of the teacher. It is important to state that Enquiring Minds is not about personal preferences that simply reflect children's immediate worlds, nor is it a progressive child-centred pedagogy that places the greatest emphasis on the individual and what they are able to do for themselves. The teacher's role in an Enquiring Minds classroom is crucial, starting with where students are at and then helping them to explain, expand and explore further from that starting point. It might be useful to think of this in terms of a 'critical pedagogy' which enables teachers and students to work together to illuminate or decode aspects of their experiences.

The subjects of the curriculum are the crucial building blocks for undertaking enquiry. This is because they provide distinctive perspectives and approaches to understanding the world. For instance, an enquiry into 'how school dinners can be improved' would benefit from ideas and concepts from a range of subjects, including science, economics, geography and history. In communicating their research, students may draw upon skills and concepts from English and media studies. The point is that in such an enquiry, school subjects provide perspectives that enable students to further their knowledge and understanding. It is important to recognise that many questions and problems require an interdisciplinary approach (for instance understanding an issue such as climate change) and this creates challenges for teachers and students.[25]

[25] Despite the bad press of so-called 'progressive' education, some commentators (eg Davies and Edwards (1999) 'Will the curriculum caterpillar ever learn to fly?' in M Fielding (ed) Taking Education Really Seriously: Four Years' Hard Labour (Routledge Falmer)) argue that these developments were "imaginative responses to questions posed by the educational concerns and the socio-economic contexts at the time". For a comprehensive account of the debates of the post-war period see Lowe, R (2007) The Death of Progressive Education: How Teachers Lost Control of the Classroom (Routledge).

ORGANISING CLASSROOMS, RESOURCES AND TIME

The changes in approaches to knowledge, curriculum and pedagogy we are advocating imply particular types of interactions in classrooms.

In most classrooms the resources used are chosen and controlled by the teacher. These may include, for example, textbooks, videos, worksheets or websites. In an Enquiring Minds approach there will be a wider range of resources available for use in learning and these will be suggested (and in many cases supplied) by students. In addition, we would expect to find a wider range of people involved in the process of enquiry as learning may take place beyond the classroom walls. What this means is that resources and sources not necessarily regarded as educational in the conventional sense are likely to be prominent and important. The Enquiring Minds classroom is as likely to feature a stack of teenagers' magazines as history textbooks. The point is, enquiry approaches that start from students' own ideas, interests and experiences are likely to require creative thinking about the resources that can be used to develop knowledge and understanding.

The Enquiring Minds classroom is as likely to feature a stack of teenagers' magazines as history textbooks

Adopting an enquiry approach also does not mean forever reinventing the wheel in terms of redeveloping resources or conceptual frameworks. For example, textbooks can be used in both transmission and enquiry approaches, but they would be used in different ways and for different purposes. They are still, however, resources that might be identified and mobilised for use by both students and teachers.

The process of enquiry will involve different patterns of time use and organisations of space. Though the organisation of time is a central aspect of the work of the school, not all learning proceeds at the same pace. For example, it is possible to imagine lessons being geared to the paces of individual learning. Different students may be working at different speeds and in different parts of the classroom. In an Enquiring Minds classroom, students will have a greater role in determining when a task is finished, or how long they wish to spend on a task.

Teachers usually control the time it takes to complete activities because it is the best way of ensuring that lessons have pace and that all students are keeping up with the work. Therefore, disrupting these temporal arrangements is likely to be difficult and challenging to manage. Yet it will become increasingly imperative for teachers working in an Enquiring Minds classroom to have to differentiate time targets according not only to students' abilities but to the type of activities in which they are engaged. This certainly does not mean allowing students to 'coast'. It means agreeing with students' time-bound targets and involving them in reviewing and monitoring their progress, and working out with them a realistic completion target.

When it comes to space, although the design of a classroom does not determine the nature of teaching and learning, it does suggest particular messages about teaching and learning. For instance, tables with students seated around each table suggest a democratic, participatory pedagogy, and a constructivist approach to curricular knowledge. It suggests that knowledge can be produced by students in the work of talk and discussion, out of their own resources, augmented by the teacher. On the other hand, the panoptic arrangement of rows of desks suggests a need for surveillance or control. A number of classroom routines are also patterned by the space it provides. For example, students routinely ask to be allowed to move around the room, or request to go to the library.

Although it is often difficult to rearrange classrooms already cluttered with furniture, an enquiry approach implies that classrooms can be reorganised as flexible spaces. This includes being able to move tables according to activity and groupings, and use of wall space not just for presentation of completed products but as spaces for the collaborative collection of ideas. Furthermore, Enquiring Minds envisages that learning does not always need to occur inside the classroom. School grounds themselves are fertile sites for the collection of data or for making observations. Alternatively, since it attempts to engage with young people's out-of-school cultures, the locality itself can become a site for enquiry.

Clearly, Information and Communications Technologies (ICTs) have the potential to support the kind of learning at the heart of Enquiring Minds. The idea that information is easily available, and that software enables people to communicate and share information and ideas, has the potential to enable students to participate in knowledge sharing and collaborative production of knowledge both within classrooms and in collaboration with others. Indeed, ICT seems to ease some of the strains on time and space that have just been outlined above. It allows students to reach beyond the limits of their school's resources, to experience other spaces (albeit virtually), and to be able to make more efficient use of time.[26]

[26] Discussions of the potential of ICT to transform learning are often polarised. For optimistic assessments see: Somekh, B (2007) Pedagogy and Learning with ICT: Researching the Art of Innovation (Routledge); and MacFarlane, A (2006) 'ICT and the curriculum canon' in A Moore (ed) Schooling, Society and Curriculum (Routledge). For an account that highlights the limited impact of ICT on learning see Buckingham, D (2007) Beyond Technology (Polity).

ORGANISING CLASSROOMS, RESOURCES AND TIME
Continued

Finally, it is worth spelling out what exactly are the potential benefits of students undertaking their own enquiries in terms of their learning. The promise of Enquiring Minds is that it potentially allows students to expand their cognitive capacities in the following ways:

- Enquiry focuses student attention on thinking about their own thinking – it induces them to take seriously how they see the world and how others see it.
- Enquiry creates an analytical orientation towards their lives – they learn to ask questions, to look for deeper reasons.
- Enquiry helps students learn to teach themselves. Few activities better prepare you for a task than an ability to conduct research. Students begin to do things for themselves rather than rely on experts.
- Enquiry negates reliance on procedural thinking. The messiness of doing research forces students to recognise the limits of methodological purity – when they get stuck, they have to interpret the situation and find ways to make sense of what they see.
- Enquiry moves students to the realm of knowledge production as it induces them to organise information, to interpret. They are no longer passive receivers of expert knowledge. They become responsible agents who engage in their own interpretations of the world around them.
- Enquiry improves thinking by making it just another aspect of everyday existence. Adopting an enquiry approach means seeing answers as tentative and provisional. Findings are always being revised and reconsidered, and in the light of new evidence can never be regarded as final.

Enquiry focuses student attention on thinking about their own thinking – it induces them to take seriously how they see the world and how others see it

"In my English classroom I might say something and they'll scribble it down. Whereas in an Enquiring Minds classroom, I might say something and they will challenge it, they will question it."

Teacher

"It's kind of like you've got a free mind, and you can explore different things that you want to learn. And you've got your right to your own opinion."

Student

04

In this section we introduce the Enquiry Cycle, a set of stages for teaching and learning in Enquiring Minds. The enquiry model is intended as a focus for teachers and students to use in order to visualise progress on any extended activity.

USING THE ENQUIRY CYCLE

USING THE ENQUIRY CYCLE

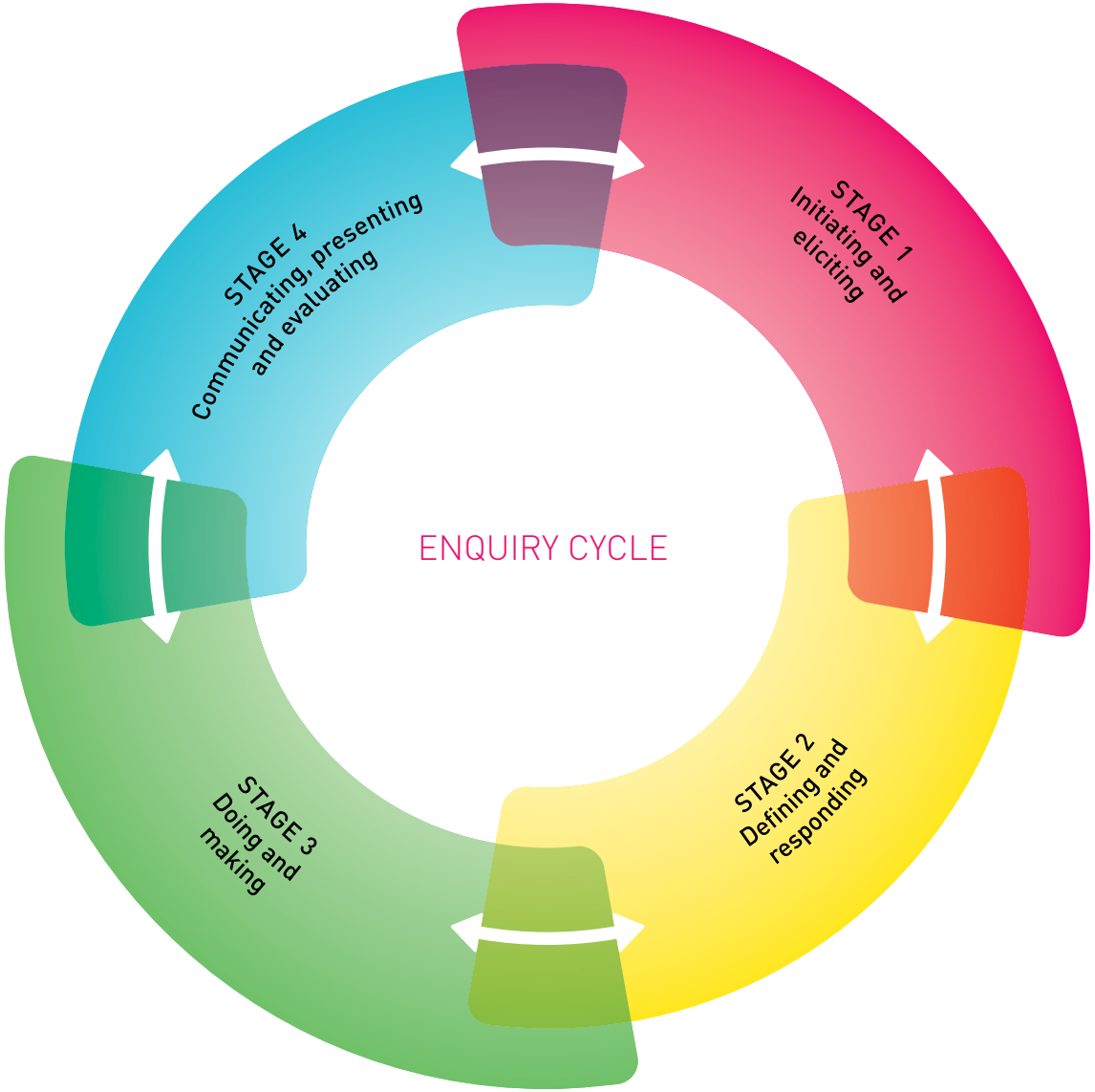
The Enquiring Minds cycle is a schematic way of plotting and carrying out any sort of enquiry-based activity. We have presented it as a wheel since we believe that students' enquiries may well 'cycle' around in deeper and deeper levels of sophistication. The enquiry model is intended as a focus for teachers and students to use in order to visualise progress on any extended activity.

The four-stage enquiry model presented in this section is intended to allow teachers to develop the type of teaching and learning described in the previous section. Of course, it is quite possible to use this model in a way that does not allow students to develop a critical approach to knowledge. In the end, the success of an enquiry approach depends on the extent to which it allows students to be creators of knowledge which is relevant to them.

The Enquiring Minds cycle draws on existing approaches to enquiry-based learning and has been developed through our work with teachers and students in our partner schools. The cycle we present here prioritises four key (and overlapping) stages in order to foreground certain practices which we think are central in supporting the goal of developing students' capacities to critically engage with and create knowledge starting from their own experiences, ideas and interests.

Additionally, Enquiring Minds aims to foster teaching and learning that does not simply stop at the stage of critique. In the following pages we explain what is happening at each stage of the cycle. The stage with the least detail is the final stage – communicating and presenting. This doesn't mean it is unimportant. In fact, the most important thing is what students decide to do with the knowledge they produce. Our vision for the project is that students produce knowledge that makes a difference to their lives. What this might mean is impossible to predict in advance, since it depends on the specific nature of individual enquiries. However, we hope that teachers engage students in discussions about 'really useful knowledge'.

The Enquiring Minds cycle is a schematic way of plotting and carrying out any sort of enquiry-based activity


ENQUIRY CYCLE
STAGE 1
Initiating and eliciting
STAGE 2
Defining and responding
STAGE 3
Doing and making
STAGE 4
Communicating, presenting and evaluating

STAGE 1
INITIATING AND ELICITING

The first stage in the cycle is about eliciting the knowledge, interests, ideas and motivation of students. The teacher's role is to help students draw on their own lives and experiences to discover things that interest them, make them excited, curious and want to ask questions. It is concerned with developing an understanding of students' worlds, for example, what they're interested in and what they might want to do next. It is also about getting students to look at familiar things from surprising angles; asking questions, igniting ideas and spurring them on. The message to students is that they have got something interesting to say – something worthwhile to bring to their lessons.

Some of the things that might be taking place at this stage include:

- finding and collecting things
- drawing, sketching, telling stories
- taking stock, observing, noting, counting
- posing questions and identifying problems
- talking, debating, disagreeing, arguing, responding to stimuli.

In Enquiring Minds activities in schools, we have seen that students are able to display knowledge about popular culture, the media, sports and new technology; about social networks in local communities and the geography and demography of their localities, as well as about how to handle money and how to 'make the best' of family and financial situations. Others have shown they have more specialist interests and burgeoning knowledge in areas as diverse as disease prevention, healthy eating and robotics. All of these are rich areas for exploration. Classroom activities, tasks and extended projects can be designed from any one of them, the object always being that students' existing knowledge and ideas can be worked on, extended and co-constructed with support from peers and teachers.

During this stage of enquiry it is important that students have the chance to do some of the following in order to reflect upon the world and generate ideas and areas of interest:

- describe
- ask questions
- explain
- list
- discuss
- estimate
- collect
- illustrate
- observe
- find things
- note
- talk
- draw
- name
- generalise
- question
- imagine
- give an opinion
- respond
- sketch
- describe
- state
- hypothesise
- measure
- pose problems

STAGE 2
DEFINING AND RESPONDING

While the first stage of the enquiry cycle is about making visible and finding out about students' existing knowledge and interests, the second stage is concerned with shaping, defining and focusing an idea or question or subject and making plans to research it further. Students need to be supported to work out what they already know about their area of enquiry and what they don't know, so as to develop a framework for further enquiry.

The teacher's role is crucial at this stage. If students have identified things they are interested in and would like to know more about, the teacher has the job of ensuring that students can advance their enquiries in meaningful ways. This will require the teacher to assess their own existing knowledge and understanding of the topic, undertake some preliminary research to identify important themes and questions, and locate resources (people/experts, information resources, methods of testing ideas) that may be useful for students. In this way teachers are adapting and responding to students' interests.

This does not mean that the teacher is doing the work for the student. Instead, the teacher is using their knowledge and expertise about learning to help students conduct enquiry. A focus on teacher-student dialogue is important at this stage, as teachers encourage and provoke students to pursue their interests. This may involve asking questions such as:

- What can you find out quickly?
- What is left unanswered?
- What direction do you want to go?
- What aspects are most interesting?
- What are the key areas to focus on?
- Are there different perspectives?
- Who might be able to help you or who might think differently about this?

At this stage, it may be valuable to encourage students to find out everything they can on a topic, to categorise and differentiate the information they've got, and then to develop and prioritise further questions.

Some of the things teachers and students might be doing at this stage include:

- finding out what's already known about the problem/area of interest
- evaluating information and resources in existence
- identifying who and what can help understand the issue/problem
- testing out existing ideas/solutions – developing new ones
- clarifying gaps in knowledge and opportunities for action
- conducting empirical research to inform idea/strategy.

During this stage of enquiry it is important for students to do some of the following in order to refine their enquiry to a 'researchable question' or area:

- match
- combine
- justify
- discriminate
- select
- re-arrange
- divide
- give examples
- compile
- reject
- select
- predict
- differentiate
- re-organise
- categorise
- distinguish
- organise
- relate
- summarise
- discuss
- separate
- breakdown
- compare
- infer
- plan

STAGE 3
DOING AND MAKING

Having focused the enquiry to something that is meaningful and relevant to students, Stage 3 is the doing and making stage, where students research, design and construct in order to make a contribution in their chosen enquiry. This may be the longest stage of an enquiry project, during which students will be engaged in a variety of tasks depending on the nature of their enquiry. It is important to stress the role of the teacher in providing structure and support for students at this stage. The range of tasks and volume of work involved may be daunting, and the teacher can help students develop a plan so that the research is divided into manageable steps. There is a risk of momentum waning if there is not sufficient structure or support for their projects. Encouraging students to manage their time, review the resources available to them, identify goals and monitor their own progress is critical to ensuring the success of this phase.

In the doing stage students are both making sense of things – making their own knowledge – and having an impact on the wider world, whether this is through consulting with others, conducting research or taking action.

At this stage, it is important to talk with students about why what they are doing matters. There may be a variety of reasons for doing the enquiry. Often the reason for doing any type of school work is to satisfy the requirements of the teacher or the exam specification. The teacher is the sole audience. One of the challenges of the Enquiring Minds approach is to encourage the belief that students' interests and the research they do are of value. Teachers may need to encourage students to be ambitious in what they hope their work can achieve.

Some of the things students and teachers might be doing at this stage include:

- consulting with others - talking with peers, parents, teachers or experts, conducting surveys/interviews, or requesting information
- keeping a log of findings, research evidence, collating the knowledge and understanding being acquired/constructed
- trying things out for real, prototyping, iterative design, scientific experimentation
- identifying a plan of action, or the format/audience for output (video, pamphlet, report) etc
- searching different sources for evidence - books, internet, TV programmes, videos, radio broadcasts
- working together and collaborating on each others' projects
- reflecting on progress and planning next stage.

During this stage of enquiry it is important for students to do some of the following in order to critique and contribute to knowledge through their enquiry:

- illustrate
- record
- analyse
- assess
- appraise
- support
- make
- create
- plan
- write
- examine
- verify
- decide
- investigate
- solve
- monitor
- compute
- test
- criticise
- construct
- devise
- study
- experiment
- evaluate
- use
- outline
- interpret
- invent
- interview
- produce
- design
- research
- advise
- compose

STAGE 4
COMMUNICATING, PRESENTING AND EVALUATING

During this stage, students communicate, share and present their new knowledge and understanding with others. There are many ways in which this could be done, depending on the nature of the enquiry. It could be a website, a report, a video documentary, a radio programme and so on. It is likely that the work will be shared and saved as a resource for others to use in the future.

During the course of their enquiry students may have opportunities to present and communicate their emerging findings to their peers and teachers, which means that communication and evaluation is something that suffuses the whole enquiry cycle.

In view of the 'vision' of Enquiring Minds, it is important that students are enabled and permitted to find an audience for their work that extends beyond the school walls. A useful notion is that much of the work usually done in schools is of the 'fridge door' variety, in which the teacher sets a task, students complete it, the teacher assesses it, and the students take it home where it might be 'published' for a while on the fridge door. There is no real problem, no real demand, no real need, no real knowledge product.

Against this, Enquiring Minds hopes to encourage a situation in which teachers and students develop relationships with local communities which allow students to undertake research into topics that are meaningful and where students know their findings will be taken seriously. This is also the key to developing students' skills of evaluation, since they are more likely to take seriously the advice and feedback of the audiences they work with.

Some of the things students and teachers might be doing at this stage include:

- creating videos, PowerPoint presentations, radio broadcasts, websites, games, graphs
- writing reports, articles
- constructing models
- performing – drama, role-play, delivering presentations
- presenting arguments to a wider audience, to key 'stakeholders' or experts
- refining their work, conducting further research to fill in the gaps
- creating interim products to further their knowledge-making (eg letters, e-mails etc)
- reflecting upon their goals and whether these have been achieved, and identifying further action or research.

There are number of features of this approach.

First, the possibilities for doing this type of enquiry work are greatly enhanced by new technologies. Simple technologies such as video and digital cameras, along with PDAs, all provide useful opportunities for data collection and communication. These can be linked up with relatively small numbers of computers.

Second, this type of enquiry requires schools and teachers to develop new types of relationships with their local communities.

Third, this type of knowledge production is not new; schools have enabled students to undertake projects for a long time. What is new is that students have the role as knowledge producers. It requires a leap of imagination so that instead of imagining schools as places where young people come to get educated, schools are research sites populated with a large number of 'enquirers', undertaking enquiries that are meaningful to them and their communities.

During this stage of enquiry it is important for students to do some of the following in order to communicate and reflect on their enquiry:

- reflect
- reconstruct
- review
- re-draft
- perform
- celebrate
- peer-assess
- modify
- express
- exchange
- present
- communicate
- evaluate
- change
- speak
- alter
- appraise
- assess
- articulate
- improve
- revise
- rewrite
- verbalise
- transform
- amend

PROGRESSING TOWARDS MORE OPEN ENQUIRY

The aim of Enquiring Minds is to progressively allow students to take full responsibility for the content, processes and outcomes of their learning. As we have suggested, this requires significant changes in teaching and learning, and developing these approaches will take time. The diagram on pages 48 and 49 provides a model of progression that shows students becoming increasingly independent learners. This diagram provides a guide to the sorts of activities likely to support students' capacity for undertaking enquiry, and an indication of the types of skills and dispositions they might demonstrate.

The diagram begins with activities and tasks structured by teachers and proceeds through a stage of negotiation, in which students develop increasing confidence and responsibility for deciding on the content and form of their learning.

The final stage is one of open enquiry in which students take full responsibility for defining, planning and completing the enquiry. It is at this stage that an Enquiring Minds approach is in evidence.

Some students are likely to be sufficiently confident and motivated to work on a self-initiated idea for an open enquiry project much sooner than others. Additionally, there will be times when children and teachers will need to move between structured, negotiated and open enquiries at the same time.

This diagram has been developed from the experiences of the schools involved in the Enquiring Minds project. What happened in these schools is described below. There are almost certainly other ways to develop an enquiry approach.

The aim of Enquiring Minds is to progressively allow students to take full responsibility for the content, processes and outcomes of their learning


Hobbies
What are you trying to catch?
How do trumpets work
Why did you choose this picture?
How far can you swim underwater?
Holidays
Where does paint come from?

A SUGGESTED MODEL OF PROGRESSION

STRUCTURED ENQUIRY
TERM 1

Term 1, from September through to Christmas, focuses on structured enquiries, with the teacher responsible for developing a carefully-structured series of activities around ideas of research and knowledge creation. This may involve students interrogating ideas about the world they live in, such as the role of television, the media and new technologies in changing the ways we live, how the built environment is produced, how and why schools operate the way they do, how people's views on children have changed, how and why fashions shift, and so on.

These should be short, focused enquiries, with the processes of enquiry made clear to students as methods to adopt when addressing any question or problem. At this stage, it may also be useful to ensure that students are developing some appropriate skills in information gathering and management, as well as their confidence in communicating to their peers and to different sorts of groups of people. Throughout, students should compile interesting questions, ideas and problems so that these can be used later.

SUPPORTED ENQUIRY
TERM 2

Term 2, which runs from Christmas to Easter, should focus on supported enquiries, during which the teacher will encourage students to identify (possibly from the last term's work) problems and issues that they want to address in more detail. (Alternatively, students may have other interests they want to pursue.) At this stage, teachers will have to work very closely with students to ensure that they are able to follow the process of enquiry. For example, it may be useful to draft a series of worksheets that take students through each stage of enquiry, from identifying the problem through to communicating their findings. This might be in the form of a project workbook, with space for students to add to it relevant information and detail.

Supported enquiries will require teachers to be detailed in their assessment of what students are doing. At all stages, students will need to be consulted about what they are doing, demonstrate progress, and be able to present some form of outcome (even if this is in the form of notes or collections of various files or objects). Teachers will need to have ongoing conversations with students about how they are progressing, and provide constructive feedback and advice which is concrete enough for students to act on.

OPEN ENQUIRY
TERM 3

Term 3 goes through to the summer holidays. It focuses on students carrying out open enquiries. By now, students should be defining their own problems and questions, and teachers should be taking a much more reactive role. Students will still need plenty of monitoring and assistance, of course, but by now should be able to identify the stages in an effective process of enquiry and be able to carry out their own systematic project. Students will by now be showing signs of becoming critical when it comes to knowledge, and able to ask questions about common-sense and widely-held assumptions. They should be asking why and how things are the way they are, and should recognise when they have collected information that either answers a question or (dis)proves the validity of an idea. They should be able to appreciate and recognise that different people have different ideas about things. In cases where students have elected to do an enquiry cycle that is more practical, they may be carrying out their own design work, supplementing this with evidence that they have interrogated a range of ideas behind their designs and taken account of these.

By the end of the year, students should be beginning to feel confident as researchers and knowledge creators, able to support their ideas with evidence of how they have interrogated them and what has emerged. At this stage, communicating what they have learned is also important, and this may include communicating with internal or external groups or individuals.

	STRUCTURED ENQUIRY TEACHER-DIRECTED	**SUPPORTED ENQUIRY** TEACHER-STUDENT AGREED	**OPEN ENQUIRY** STUDENT-DIRECTED
TEACHERS	– Teachers design activities and materials to help students share ideas and interests, and to develop good questions and focus for enquiry – Teachers set clear ground rules and high expectations – Teachers lead planned and structured enquiries, making the model of enquiry being followed clear – Teachers ensure that resources and reference materials are available, including ICT and libraries – Teachers make it clear how curricular subjects provide skills and ways of looking at ideas and problems, and that combining them can be useful	– Teachers help students to identify good ideas, questions or problems worth enquiring into, and agree with them their focus for enquiry – Teachers help students to plan their own short enquiries, usually in small groups, by following a clear model – Teachers advise students on possible sources of information to look at and subject-based skills or knowledge they can use – Teachers differentiate on structuring students' enquiries – Teachers check students' work regularly, and provide guidance, ideas, and advice on progressing	– Teachers encourage and allow students to come up with their own enquiry – Teachers provide support and guidance where required or requested – Teachers help to locate resources requested by students – Teachers support students to be critical about sources of knowledge – Teachers support students' communication skills – Teachers help students to identify relevant audiences for their work – Teachers assess students' progress thoroughly through dialogue and written feedback
STUDENTS	– Students describe their experiences and ask questions – Students gather material from a range of resources and sources, including library books, the internet, and home – Students discriminate between factual and cultural knowledge – Students make use of different school subject resources and knowledge, often in combination – Students collaborate in small groups – Students work on different presentation and communication formats	– Students take more responsibility for deciding on their focus in groups and individually – Students make use of multiple subject resources and other types of knowledge – Students improve their use of ICT and library-based resources – Students become more able to tell authoritative sources from others – Students become confident communicating to audiences in a range of formats – Students revise their contributions	– Students become increasingly inquisitive – Students collaborate with others in different ways – Students are able to pose problems, ask questions and recognise issues to explore – Students show signs of being critical about how knowledge is produced and changed, and for what purposes – Students are able to look at things from different perspectives – Students are able to propose solutions to problems and questions – Students decide how to communicate learning to different audiences

05

In this section we suggest some of the starting points for developing Enquiring Minds in schools.

GETTING STARTED WITH ENQUIRING MINDS

GETTING STARTED WITH ENQUIRING MINDS

Making the shift to an Enquiring Minds approach requires time, energy and resources, and this means that schools interested in developing Enquiring Minds will start from different places and develop the approach in line with their own existing curriculum plans. For us, the bottom line is that enquiry involves student-led activity, where responsibility for defining the content, methods of working and ownership of the products of enquiry lies with students. In what follows, we describe how a school might gradually 'scale-up' its enquiry-based teaching and learning activities – from initial low-risk work within subjects through to more ambitious whole-school arrangements where students are responsible for defining the direction of their learning for a high proportion of the time.

The first three steps are preparation for enquiry-based teaching.
They involve teachers and subject departments developing enquiry approaches within existing curriculum arrangements. We are aware that some schools are already experimenting with these approaches and that there are existing traditions of enquiry teaching within school subjects. The limits of these approaches is that, set within existing curriculum models, there are significant barriers to allowing students to initiate and define the content of enquiry.

Steps 4 and 5 are Enquiring Minds in practice.
The defining features of the more ambitious steps (4 and 5) are that students have control over the content and methods of enquiry, and that the curriculum is organised to allow this to happen. It is at this point that students and teachers are co-producers of knowledge.

Making the shift to an Enquiring Minds approach requires time, energy and resources

SCALES OF IMPLEMENTATION

PREPARING FOR ENQUIRY BASED TEACHING AND LEARNING

In **Step 1**, teachers operate in their own subject areas but allow students to define an area of that subject that they want to look into further, probably from a selection of themes the teacher feels adequately prepared for in advance.

In **Step 2** a whole department of teachers work together to develop a wider range of possible activities and themes for students to pursue.

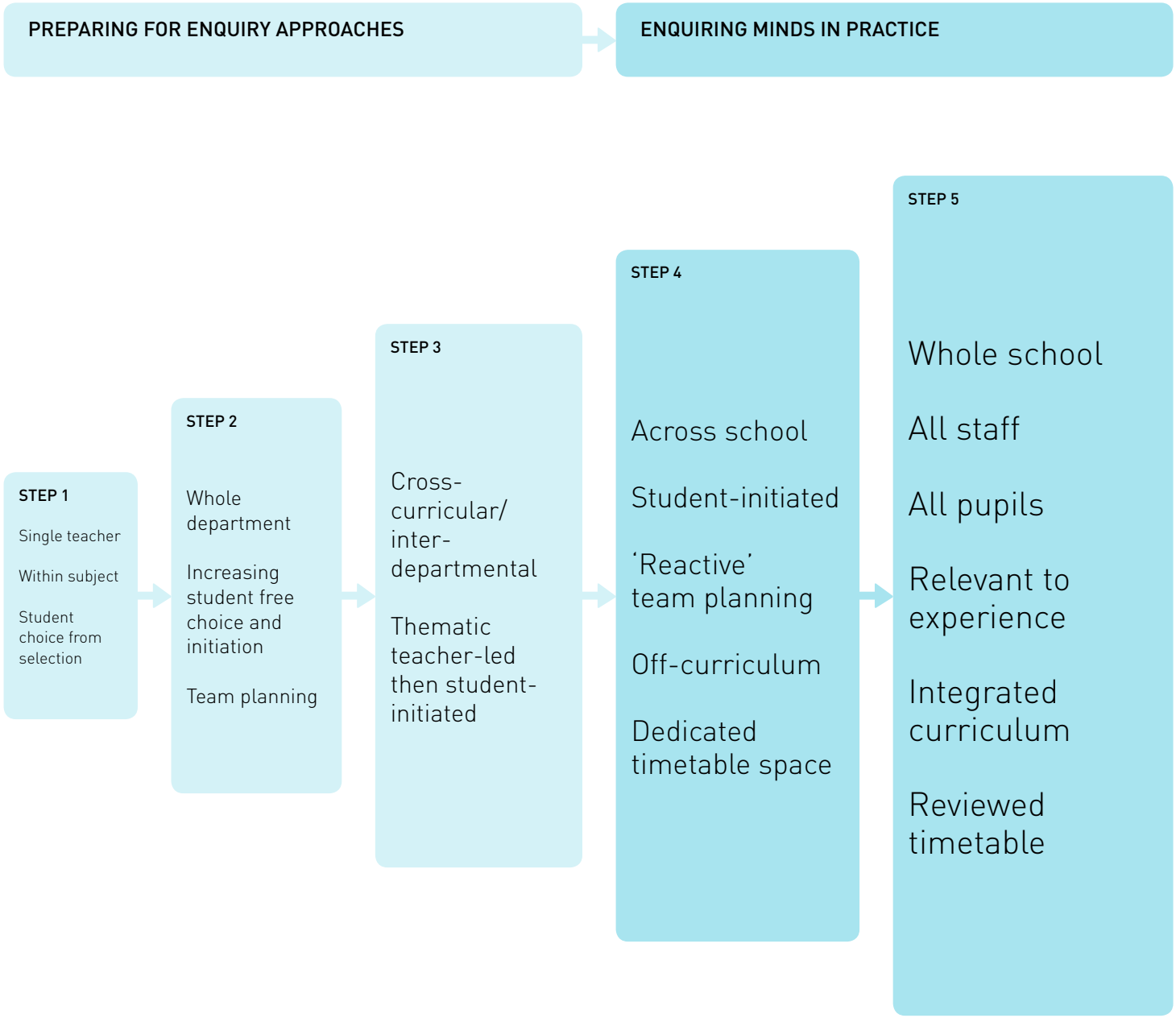
Step 3 involves different departments operating together in order to reinforce the ways in which different subjects look at different sorts of knowledge. Increasingly at this level of implementation students should be able to define ideas for projects that teachers then work to link together through subjects.

ENQUIRING MINDS IN PRACTICE

Steps 4 and 5 are what Enquiring Minds looks like when ambitiously implemented across school.

Step 4 is characterised by students having timetabled space to carry out enquiries that are not especially tied to any single subject (although a range of subject knowledge may inform them along the way, where appropriate).

Step 5 involves the entire school. A large proportion of teaching and learning at this stage takes place in the context of a school which recognises and values students' existing knowledge and experience, and engineers large parts of its curriculum around them.


PREPARING FOR ENQUIRY APPROACHES
ENQUIRING MINDS IN PRACTICE
STEP 1
Single teacher
Within subject
Student choice from selection
STEP 2
Whole department
Increasing student free choice and initiation
Team planning
STEP 3
Cross-curricular/ inter-departmental
Thematic teacher-led then student-initiated
STEP 4
Across school
Student-initiated
'Reactive' team planning
Off-curriculum
Dedicated timetable space
STEP 5
Whole school
All staff
All pupils
Relevant to experience
Integrated curriculum
Reviewed timetable


HUNGARY

06

This section provides some advice on developing cycles of enquiry in schools. We offer examples of activities or resources that could be used in the different stages of the enquiry cycle; these are also illustrated throughout by small case studies of activities observed in the development of Enquiring Minds by teachers.

PRACTICAL IDEAS AND RESOURCES

STAGE 1
INITIATING AND ELICITING
ACTIVITIES

A-Zs

Students create a pictorial or written alphabet in which each letter is illustrated by something relevant to the topic – it could be the local area, the school, the year group, work, play, 'growing up' etc. It is important that each word or image represents something about the theme. Students may need some support initially to think beyond literal representations of the letters.

This activity involves discussion with others and can lead to interesting discussion and raise questions for further enquiry. It can reveal students' values and perceptions about the place or topic for which they are creating the A-Z.

This activity may be enhanced using digital cameras (if available).

Beat the teacher

The teacher invites pupils to ask questions about a topic of their choosing. If the teacher is unable to answer the question it is recorded. In this way a 'question bank' is established.

This activity can allow teachers to demonstrate that we don't have the answers for everything, and helps build a classroom culture where questioning and enquiry are commonplace.

The questions generated can provide the basis for further study.

Collage and montage

Collages and montages are a good way of helping students to build up a representation of a theme or topic. The teacher may provide students with pictures, newspaper cuttings, magazines, or ask students to collect their own materials.

It's important to see the product as a starting point for enquiry. The key is to get students to share the thinking that went into making the collage, for instance what categories they chose. Collages can be the basis for whole-class discussion, and other students may be encouraged to ask questions about them. The montages can be used as a basis to discuss the students' perceptions of the issue in comparison to other people's points of view.

Data race

This activity involves students finding quick answers to questions they may have. The teacher sets students off on a 'race' to find out key bits of information on a topic. The teacher may suggest sources, or allow students to choose how to find the information. A suitable time limit can be set.

The activity is a quick way of gathering and sharing information about a topic. It can lead to discussions about the nature of information and data sources, and the teacher can raise questions about the accuracy and sources of the information, and suggest other ways of approaching the topic.

Desert island objects

The teacher gets the class to imagine what a desert island might be like and then quickly communicate ideas and visions to build up a shared picture. Students are told that they're getting sent to this desert island and they may only take six items with them. They could be practical items to help them survive or they may be things that remind them of what they're leaving behind. In small groups, they then discuss the reasons behind their choices. As a whole class they list all the items and discuss any similarities/differences.

The desert island concept is a good way to find out what is important to students and can lead to further questions for enquiry.

Future autobiography

The teacher provides students with a set of pictures of older people and asks them to produce a biography for each of them. Students then produce a narrative of their own life story as if it were 2050, and they were 60 years old.

This activity can prompt reflection on the nature of social change and allows students to voice their own aspirations and ideas about the future. The discussion may raise questions that are worthy of further study.

Importance inventory/Traces of me

Students produce a collage which represents aspects of their lives and identities. These are presented on a display. These documents can be used to prompt discussion and reflection on the things that are important to students and why.

There may be common themes or ideas that students decide are important to investigate. For example, in one class we observed, students were puzzled as to why girls' presentations contained many images of animals, whilst boys were dominated by football and bikes.

In one class we observed, students were puzzled as to why girls' presentations contained many images of animals, whilst boys were dominated by football and bikes

STAGE 1
INITIATING AND ELICITING
ACTIVITIES

Future forecasts – what if...?

The teacher encourages students to produce 'scenarios' that predict how social or technological trends might influence people's behaviour in the future or what greater effect they might have on society. For example, what would happen if:

- flying was so heavily taxed that no-one could afford to fly any more?
- cars were able to be powered by water?
- people lived until they were 150 years old?

This activity allows students to explore open-ended questions and compare desirable, probable and possible futures. The forecasts may be used as a basis for research into actual predictions and to likely changes.

Local safari – thinking about place

The teacher holds a group discussion about the local area. This may involve questions such as: Are there distinct zones? Has it got a certain character? What is the history of the area? Students then create 'mental maps' of the area – starting by placing their home in the middle and working out from there. They are encouraged to think about landmarks, key buildings, public spaces, areas of interest, personal connections, interesting bits, boring bits, and so on.

This activity is a good way to undertake an initial study of a place and to get a sense of students' initial perceptions about their surroundings.

These mental maps can then be shared verbally with the rest of the group or used to create a written/illustrated group or individual map. The discussion can prompt reflection on the issues that affect that area and may form the basis for further enquiry.

Local safari – looking at place

The teacher takes students on a walk around the local area, encouraging them to collect artefacts, make rubbings, take digital photos and draw sketches to record the features that feel important in determining the character of the area. These could include structures, natural forms, landmarks, building materials, street furniture, traffic and people.

The teacher then gets the students to compare the mental map from the previous local safari activity with the reality and collected artefacts, and discuss the differences. The artefacts and photos can also be used to make a 'messy map' (see below).

This activity provides an opportunity to move around and get outside the classroom. It can help students to notice things in their locality that might go otherwise unnoticed.

Messy maps

Students are asked to produce a 'messy map' of a place or a topic, or an idea. The idea is to fill it with as much detail as possible – in the form of facts, impressions, poems, sketches, photos, and so on. It can be an ongoing map that students can contribute to over time.

Messy maps help to capture the real 'texture' of something – which is impossible to do in any one medium.

Patchwork of knowledge

Students use the internet, books and other research methods to gather as much information they can find on a particular topic – this may include facts, images, quotes and video clips. At this stage pupils are encouraged to gather as much information as they can, rather then making any sense of it. They can then start to refine and focus on specific areas of the topic.

This activity is an opportunity to openly explore a subject before focusing on a particular question or area.

Random things about me

This activity involves looking at different online blogs where people list things about themselves and their interests. These can be used to have a discussion about the sorts of things they include, and what is excluded. Students are invited to come up with their own lists along the lines of '10 things about me'.

The activity can show students that everyone has something interesting to say about themselves and their life, and to prompt reflection on the groups' choices. This may lead to ideas for further enquiry.

What they don't teach you at school

The teacher starts a conversation about what students learn at school and what they don't. The students list all the compulsory subjects and ask questions such as: What is missing? What would be really useful? Why? Do students learn the same things that their parents learnt?

This activity can give students the chance to say what is important to them outside of school as well as in school, and may lead to attempts to produce their own preferred enquiry curriculum.

Wonder wall (ideas wall)

This is a dedicated wall space (though it could be electronic) for pupils to add their questions as they arise. The teacher's role is to create a classroom where students are encouraged to ask open questions. If it's working well it offers students a chance to mull over things in their own time and a permanent space to ask questions as they arise. Not all the questions need to be capable of a short and quick answer.

The questions can be followed up and explored as part of the enquiry curriculum.

5 Whys

This is simple technique to get students asking questions. The aim is to ask 'why' questions in response to five consecutive answers. For example: Q: Why do you exercise? A: Because it's healthy. Q: Why is it healthy? A: Because it's good for me. Q: Why is it good for me? And so on.

The technique can encourage people to examine and express the underlying reasons for their behaviour and attitudes. It promotes an enquiring stance and challenges students to examine their thinking and reasoning.

STAGE 1
INITIATING AND ELICITING
DIGITAL TOOLS

There are many free and easy-to-use web-based resources that could be used as a stimulus for enquiry, or used to elicit ideas from students. Here are a few examples with links and one potential use for each of them:

Image Quiz
www.gamesforthebrain.com/game/imagequiz
The image quiz presents a random selection of photos from which visitors are invited to deduce the meaning – which word, person, object is being represented?

One use for it: A warm-up exercise to encourage debate and discussion and elicit ideas and interests.

KartOO
www.kartoo.com
KartOO is a search engine with visual display interfaces. KartOO gathers the results, compiles them and represents them in a series of interactive and visual maps.

One use for it: Quickly gather and present information related to a theme or topic. The visual results interface makes it good for searching the web as a group.

StumbleUpon
www.stumbleupon.com
StumbleUpon is a delightful way to navigate the web; rather than searching from a textual prompt, it allows learners to be surprised and excited by the wide range of websites that the site offers – based upon previously-indicated interests.

One use for it: A good tool to generate questions and discussion.

We Feel Fine
www.wefeelfine.org
A data visualisation project which scours the internet for the sentences prefixed with 'I feel...' on thousands of blogs then displays data/content in various visual formats.

One use for it: Use it as a basis to explore emotions, the ups and downs of ordinary lives or the phenomenon of blogging.

10x10
www.tenbyten.org
10x10 is an interactive exploration of the words and images that currently define our time – updated every hour. The collation of content is automated, based on what is being published on news sites across the web at the current time. It's free to access and easy to use – searchable by image or keyword.

One use for it: To prompt a discussion based on current world events.

10x10 is an interactive exploration of the words and images that currently define our time

See www.enquiringminds.co.uk/try_it/digital_tools for more information and ideas.

STAGE 1

INITIATING AND ELICITING

CASE STUDY 1

The students were told their project focus was up to them, but that they would have to agree as a group on the most popular idea

Ideas wall

Teachers were preparing their Year 8 group to define and carry out their own whole-class project. The students were told their project focus was up to them, but that they would have to agree as a group on the most popular idea. The teachers asked the students to write down on post-it notes as many ideas, questions or problems that they could think up and would like to do a project about. They also put up four large poster-size sheets of paper on the walls, headed 'easy', 'silly', 'hard' and 'impossible'. The students posted their notes in the relevant categories. Then they circulated around the room reading all of the ideas and questions, adding any other notes, endorsements or additional questions if they wanted. The teachers ran a short group discussion about some of the questions and ideas, asking students why they had categorised some as silly or hard and so on. They added another poster to the wall, headed 'worth doing', and students then chose the idea or question that most appealed to them and moved the relevant post-it note there. The teachers organised a class voting system, based on proportional representation, so that students all got two votes for their favoured two ideas.

STAGE 1
INITIATING AND ELICITING
CASE STUDY 2

The teacher set up a video camera in the corner of the classroom, and asked students to make their own version of the advertisement, based on their own questions, problems and ideas

Talking heads video

A teacher was working with a group of Year 8 students for the first time. He told them they were doing a project that was about students posing themselves difficult problems and questions which they could then investigate and attempt to solve themselves. He showed them a television advertisement from the TDA (Teacher Development Agency) in which a number of students ask a variety of questions; some challenging, some a little odd. The students, working in small groups of three, then came up with lots of their own ideas and questions, which they wrote down as a spider diagram on large sheets of paper. In the next lesson, the teacher set up a video camera in the corner of the classroom, and asked students to make their own version of the advertisement, based on their own questions, problems and ideas. At the end of the lesson they watched the video and the teacher saved it as a record of ideas for later use.

STAGE 2
DEFINING AND RESPONDING
ACTIVITIES

This stage of the enquiry is all about making connections – categorising, comparing and compiling information. Students create a solid starting point for their enquiry and plan their project. Below are some ideas for defining, shaping and extending students' ideas, and some techniques for looking at those ideas in different ways.

Analysis of activity

The teacher asks the students to list or represent in detail all the tasks, actions, objects, performers and interactions involved in a process. For instance, what is involved exactly in sending a text message, or in riding a bike, or making a football boot?

In documenting the minute detail of an activity, gaps or surprises are often presented – new considerations – that may open up further questions or focus the direction of an enquiry. Any gaps or new considerations can be used to drive further research.

Compare and contrast

Students analyse and list the differences and the similarities between the items they want to make comparisons between. This process can help students to process and make sense of the similarities and differences between two different points of view/arguments.

Diamond 9

This activity involves arranging nine items or choices into priority order, in the shape of a diamond with the most important at the top and the least important at the bottom. The activity is useful in helping students make choices between competing alternatives. When done as a group, it can encourage negotiation and the clarification of ideas.

What is involved exactly
in sending a text message,
or in riding a bike, or making
a football boot?

Filter for focus

In pairs or groups students work together to agree the top five most important words in a piece of text, sections on a web page, sub-themes of a topic, and so on. When ready each group takes it in turns to write their key items on the board. Other groups do the same, but can only add words that are not already there. The activity encourages students to focus on the most important aspects of a topic. When working well, it can help students to clarify their understanding of the essential features of a theme or issue.

For and against (and in between)

This is a simple technique that encourages students to map out all the different sides of an argument before seeking to identify their own position. Just as important is to encourage students to go beyond the 'black' and 'white' and recognise the grey areas in between. More refined approaches can begin to examine the categories themselves and see whether they represent an adequate view of the theme or issue.

SWOT analysis

In a SWOT analysis students consider an issue or decision and analyse it in terms of its strengths (or positives), its weaknesses (or negatives), what opportunities and what threats it presents. This activity goes beyond simple comparisons by analysing an issue or an argument in terms of its strengths and weaknesses as well as opportunities or threats.

Thinking hats (Edward De Bono)

Edward De Bono's 'thinking hats' each take a different stance towards a question or problem. Students can be encouraged to put on different hats to examine a question from a variety of perspectives. For instance, white hat thinking focuses on the known facts; black hat thinking involves taking a critical stance. Students can be encouraged to analyse and document their thinking and understanding around their topic according to each of the hats.

Students can be encouraged to put on different hats to examine a question from a variety of perspectives

STAGE 2
DEFINING AND RESPONDING
DIGITAL TOOLS

Here are a few examples of online resources that could be used to support the second stage of the enquiry cycle. Each example has a web link and suggests a potential use.

Exploratree
www.exploratree.co.uk
A free online resource developed as part of the Enquiring Minds project. Exploratree offers a series of interactive thinking guides – or frameworks for thinking – as well as tools to enable you to create your own.

One use for it: Use it to support students' thinking about an issue, or to plan an enquiry project.

Mindmapping tools
www.mind42.com
A collaborative browser-based online mind mapping tool. It allows you to manage ideas, whether working individually or as a group.

One use for it: Brainstorm and document ideas as a whole class.

Skrbl
www.skrbl.com
Skrbl is an online web resource which allows users to type notes, sketch drawings, upload pictures and share files.

One use for it: As a digital repository for a 'patchwork of knowledge' activity.

Tumblr
www.tumblr.com
Tumblr is a variation of a blog that favours short-form, mixed-media posts rather than longer text-based posts. A resource for capturing information from other sites, Tumblr allows users to gather together information and to share it with others who are working in the same area – without providing explanation or commentary.

Once use for it: To gather together information and share it with others who are working. Could also be used as a learning log.

Wikispaces
www.wikispaces.com
A visual web editor for student web authoring. Wikis are very easy to create, use and edit, and are ideal for the collaborative creation of text documents.

One use for it: students read and review one another's work by leaving comments or amendments where necessary.

Tumblr is a variation of a blog that favours short-form, mixed-media posts rather than longer text-based posts

See www.enquiringminds.co.uk/try_it/digital_tools for more information and ideas.

STAGE 2
DEFINING AND RESPONDING
CASE STUDY 1

To help students think about the many aspects of this topic, the teachers asked each student to start making a scrapbook

Scrapbooking

Students in one Year 8 group decided they wanted to develop their enquiry into the theme of 'sex and sexuality'. To help students think about the many aspects of this topic, the teachers asked each student to start making a scrapbook. The teachers provided a stack of newspapers and magazines, and stated that the media is responsible for communicating to the population many things to do with sex. The students cut out relevant things to do with the topic area and stuck these in their books. They included images, headlines, whole stories, tabloid cartoon strips, 'agony aunt' columns, and so on. They also looked at a number of websites aimed at teenagers and printed off relevant pages or items, including quizzes, polls and advice pages. At home, the students noted down television programmes that mentioned sex, and what they said or represented about it, and continued contributing to their scrapbooks. At the end of this process, the teachers encouraged class discussion about the issues or themes that had been raised, and used this emerging knowledge as the basis for agreeing with students what they wanted to look into in more detail.

STAGE 2
DEFINING AND RESPONDING
CASE STUDY 2

By the end of the activity, the students had all completed highly detailed posters which expanded from the centre to describe each object's local and personal, global and historical impacts

Thinking boxes

In another Year 8 class, students were developing small group projects on different new technologies. These included mobile phones, computers and video games consoles. The teacher was concerned that students examined these items in depth and detail. He designed a task which involved the students agreeing in their groups on a simple description of their item. This was written on a small slip of paper. He then handed out larger sheets, and the students stuck their description in the middle. Around it, they then had to write down how their chosen technology affected their everyday lives. For example, how had video games consoles influenced the lives of some of the boys in the class? After this, the students were provided with larger sheets again, and this time they had to do some research, using the library and the internet, about the global impact of their items. They then had to research their item's development over time, and finally speculate about how such technologies would develop in the future. By the end of the activity, the students had all completed highly detailed posters which expanded from the centre to describe each object's local and personal, global and historical impacts. Students added other notes, images and decoration, and then read and rated each others' depth of research and clarity of communication. The teacher supported the students throughout with a set of step-by-step instructions and resources. The internet and books from the library were also made available for all sessions.

STAGE 3
DOING AND MAKING
ACTIVITIES

This stage of the process is where students are doing their own research. They may be making prototypes, finding things out, interviewing people, searching the web, contacting 'experts'. This may be the longest stage of the enquiry cycle, where students are likely to need the most support. Students' first instinct may be to rely on the web at this point, and the examples in this section offer other ways forward.

What happens at this point is clearly dependent on the nature of the enquiry students are working on, so the list below contains just a few ideas. As always, much depends on the creativity and imagination of students and teachers to find ways to make the enquiry meaningful and challenging.

Consult the public
Students may decide they need to undertake a public consultation about their enquiry topic. They might try to raise the theme in local newspapers, or hold an event which invites interested parties to come and share their ideas.

Correspond with an expert
Often, schools and teachers themselves may not have enough expertise on a student's chosen topic to help them progress. It may be possible to identify a relevant 'expert' in this area, find contact details, and to encourage students to write a letter or e-mail.

Interviews
Interviews can be used to help students gain an insight into people's experiences. These can range from short structured questionnaires to longer open-ended interviews, depending on the nature of the enquiry.

Just write
Researchers stress the importance of writing throughout the process of enquiry, since it helps to clarify and formulate ideas. So one approach is to encourage students to write down what they know about the topic they've been researching. The writing they produce during the course of the enquiry may form the basis for a final report.

Still-photo survey
Visual techniques can be an interesting way of capturing the nature of activities. For example, if students are enquiring into 'risks and hazards', they could take photographs that demonstrate these. Photographs provide interesting artefacts for analysis.

Time-lapse video
Students set up a video camera in a location to capture events over a period of time. The footage can be analysed as evidence to feed into the project. This approach is useful where students want to study change over time. For instance, setting up a camera in a school playground may provide interesting insights into the use of space by different groups within a school.

STAGE 3
DOING AND MAKING
DIGITAL TOOLS

Here are a few examples of online resources that you could use to support this third stage of the Enquiring Minds cycle. Each example has a web link and suggests a potential use.

Clusty
clusty.com
Clusty provides a different way to search the internet. It searches a wide variety of other search engines and brings the results to one page. The interesting part of this tool is how the results then are clustered into groups, highlighting particular links between the search results.

One use for it: Use Clusty as a search interface for the web research element of an enquiry project.

Google SketchUp
sketchup.google.com
Google SketchUp is a powerful, but easy to learn 3D software tool that is great for the conceptual stages of any design project. It's free to download and use and models can be saved locally or uploaded and shared in the online 3D warehouse.

One use for it: Students re-design an element of their school – the playground, science classroom or common room.

GrupThink
www.grupthink.com
Grupthink provides an online space to explore open-ended questions with others – either with closed groups (classes, year groups, whole school) or with all people using Grupthink. Express opinions, rate other people's answers, make decisions.

One use for it: Gather people's opinions from across the school; make decisions.

Survey Monkey
www.surveymonkey.com
Online tool to quickly create and publish custom surveys and then view results graphically and in real time.

One use for it: Students create a questionnaire and distribute it across the school.

Vanilla
www.getvanilla.com
Vanilla is an open-source and multi-lingual discussion forum for the web.

One use for it: Students communicate with people external to school to help them with their enquiry.

Google SketchUp is a powerful, but easy to learn 3D software tool that is great for the conceptual stages of any design project

See www.enquiringminds.co.uk/try_it/digital_tools for more information and ideas.

STAGE 3
DOING AND MAKING
CASE STUDY 1

The teachers emphasised how it was important for students to keep notes of what they found out and what sources they used; each student was given a small research notebook

Personal research notebooks

A Year 7 class were starting their own individual research-based projects, during which they would be using the internet and the library to research a topic of their own personal choice. The teachers emphasised how it was important for students to keep notes of what they found out and what sources they used. Each student was given a small research notebook. They were told that these were for their personal reference, and that they were simply to allow students to keep a record of their findings to use later when writing a report or presentation. The teachers also used the notebooks as the basis for discussing with students, on an ongoing basis, how they were progressing with their research, and for writing down points of advice, such as specific websites or search terms that might be useful, or specific questions for them to investigate.

STAGE 3
DOING AND MAKING
CASE STUDY 2

By playing the game, the students had revealed that they already had lots of knowledge that the teachers knew nothing about

Beat the teacher

In one session, teachers encouraged students to understand that during Enquiring Minds lessons lots of different sorts of knowledge are valued. The class spent 15 minutes playing 'Beat the teacher'. The teachers took on the role of 'incredibly knowledgeable' teachers, and challenged the students to ask questions that the teachers would not be able to answer. The teachers sat in the centre of the classroom, with students sitting around them. One student was responsible for tallying the score on the board. Taking it in turns, students asked the teachers any questions they could think up. At the end of the challenge, the teachers had only been able to answer a few of the students' questions. Afterwards, the teachers claimed that they did not have a big syllabus to follow, and that the students would be responsible for shaping the content of the lessons. By playing the game, the students had revealed that they already had lots of knowledge that the teachers knew nothing about.

STAGE 4
COMMUNICATING, PRESENTING AND EVALUATING ACTIVITIES

This fourth stage is an opportunity for students to communicate, share and present their work with others. For obvious reasons, at this stage it is difficult to define what sorts of activities students will be doing. At this stage, then, we have just supplied a few ideas.

The outcome of students' enquiry could include a highly polished piece of work as the culmination of an extended period of research, to be shared and then saved as a resource for others to use in the future, such as:

- a website
- report
- video documentary
- radio programme
- write and rehearse a play
- stage a show or exhibition
- a model
- a design portfolio
- staged and recorded debate or argument.

It may be that students present and communicate their emerging findings on a much more regular basis, through:

- brief presentations
- short reports
- role-play
- photographs.

At the stage of evaluation, students might:

- produce a self-report
- assess their peers' progress.

Students might also be involved in sharing the results of their enquiry with external audiences, by doing any of the following:

- write to a local newspaper
- contribute to a consultation or debate on issues that matter to children
- setting up and collecting petitions.

The outcome of students' enquiry could include a highly polished piece of work as the culmination of an extended period of research

STAGE 4
COMMUNICATING, PRESENTING AND EVALUATING
DIGITAL TOOLS

Here are a few examples of online resources that you could use to support this fourth stage of the Enquiring Minds cycle. Each example has a web link and suggests a potential use.

Audacity
audacity.sourceforge.net
Audacity is free, open source software for recording and editing sounds. Use it to record live audio or to cut, copy, splice, and mix sounds together.

One use for it: Students create a radio programme to present their findings or an audio advert to encourage people to come to an event.

Chew TV
www.chewtv.com
ChewTV is a broadband television channel run by young people for young people.

One use for it: Students can create their own video from the results of their own enquiry projects and submit to the website to share with other young people.

Create-A-Scape
www.createascape.org.uk
A free resource for schools to create their own mediascapes. A mediascape is a digital layer of sounds, images and video overlaid over a real outdoor location – which is accessed via a PDA and optional GPS.

One use for it: Existing students create a tour of the school for new starters.

Global Ideas Bank
www.globalideasbank.org
Global Ideas Bank is a website to which anyone can add their own ideas for a brighter future, which other visitors can then vote on.

One use for it: Students could come up with an invention designed to make childhood better in the future, and add it to the bank.

SlideShare
www.slideshare.net
SlideShare is an online space that enables users to upload presentations (including PowerPoint presentations, pdfs and OpenOffice documents) to share with others.

One use for it: If students are creating a PowerPoint presentation to share the findings of their enquiry this is a good opportunity to extend their audience and get their work up on the web.

ToonDoo
www.toondoo.com
An online tool for creating short comic strips. It's quick and easy to use, and includes different styles of backgrounds and characters. Flexible enough to create a variety of different styles of comic. Users add their own speech, thoughts and captions.

One use for it: This provides an inventive and fun alternative way of presenting the results of students' enquiries.

See www.enquiringminds.co.uk/try_it/digital_tools for more information and ideas.

STAGE 4
COMMUNICATING, PRESENTING AND EVALUATING
INITIATIVES, PROGRAMMES AND COMPETITIONS

The following table lists initiatives and competitions that may provide an external audience for young people's enquiry projects. Alternatively there are many regular initiative and competitions for schools to get involved in that might provide a good stage or goal for enquiry projects. Here are some examples:

BBC Blast
www.bbc.co.uk/blast
Blast inspires and supports 13-19 year-olds to get creative. It helps develop skills to turn ideas for art, dance, film, music, writing and games into a reality. Work can be uploaded to the online showcase.

BBC School News Report
news.bbc.co.uk/1/hi/school_report
BBC News School Report gives 12-13 year-olds from UK schools the chance to make their own TV, radio or online news at school and to broadcast it via the internet.

DepicT!
www.depict.org
DepicT! seeks to uncover emerging filmmaking talent which evidences originality, imagination and the ability to engage the audience in a mere 90 seconds or less. The annual competition is open to short films of all production techniques, including animation, documentary, drama, experimental or art film and hybrid work.

Eco Schools
www.eco-schools.org.uk
International group of schools working towards education for sustainable development and a better quality of life for local and global communities.

F1 in Schools Challenge
www.f1inschools.co.uk
F1 in Schools Challenge is a competition, open to all UK-based secondary schools, colleges and (organised) youth groups, to design and manufacture CO^2 powered model Formula One cars. Student teams compete against each other in a national championship to determine the fastest and best engineered car in the UK.

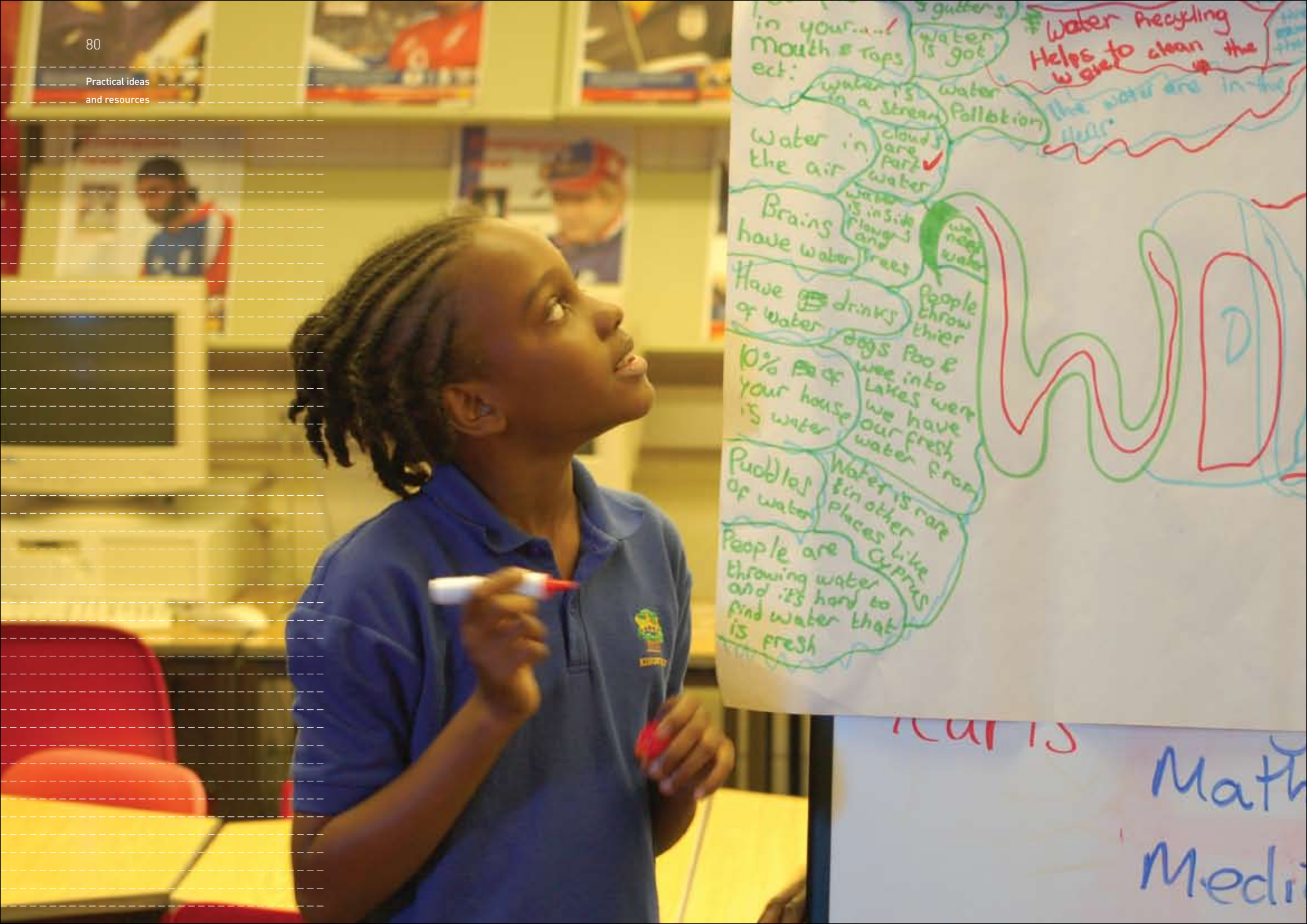
Radiowaves
www.radiowaves.co.uk
Radiowaves is a unique international network of online school radio stations created specifically for young people. It gives schools and students a voice on a safe educational platform.

"It's made me reflect a lot about the way I teach – allowing students a lot more freedom within a lesson, within a structure in order for them to gain ownership over what they're doing... in some ways I guess it's changed my approach to normal teaching."

Teacher

"It's like something which I would usually do maybe outside of school. I look forward to it because each individual person gets to study what they want to study. I want to study this, so I do look forward to it."

Student


Water Recycling
Helps to clean the water
Water Pollution
Water in the air
Clouds are part water
Brains have water
People throw thier
Have drinks of water
Dogs Poo & wee into
10% of your house is water
Lakes were we have our fresh water from
Puddles of water
Water is rare in other places like Cyprus
People are throwing water and its hard to find water that is fresh

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FURTHER INFORMATION

LINKS WITH OTHER INITIATIVES

This guide has explained the thinking behind the Enquiring Minds project. At this point, it is important to note that Enquiring Minds is being developed at a time when there is a concern to develop creative and innovative approaches to teaching and learning. There are a range of initiatives that share with Enquiring Minds the vision of encouraging independent, critically-minded and creative students. These include:

Opening Minds: this programme of curriculum innovation led by the RSA is potentially a useful partner activity for Enquiring Minds. The sorts of skills and competencies that this programme promotes would be a useful grounding for students entering Enquiring Minds classrooms. Some schools may want to introduce students to Opening Minds in the first instance and then introduce them to Enquiring Minds after basic team-working, information handling skills have been developed.

Creative Partnerships: the Creative Partnerships programme offers the opportunity for many (although not all) schools to build relationships with creative practitioners in science and the arts. The Enquiring Minds approach to teaching and learning actively encourages engagement with experts and knowledge outside the school. One suggestion is that teachers developing Enquiring Minds approaches could work with teachers leading on Creative Partnerships initiatives to identify ways of building links between programmes.

Enterprise and citizenship education: These approaches place significant emphasis on empowering students to be able to act upon and in the world, to innovate, to make a difference, to engage with the world around them. Enquiring Minds approaches can be used to enrich and complement these strands of work in schools.

ICT policies: Enquiring Minds offers a model for the creation of knowledge-sharing and knowledge-building classrooms in which digital technologies are used to support students to interact with each other, share knowledge and information, and collaborate with others in their schools and in the wider community. It integrates the use of ICT into classroom practice and as such, places demands upon school ICT policies to enable easy and non-restrictive use of digital technologies for students in school and, increasingly, in the home. The Enquiring Minds model, and the examples of activity we have shown, provide a resource for planning school ICT policy.

Student/learner voice: by embedding students' interests, experiences and ideas at the heart of the teaching and learning process, Enquiring Minds clearly connects with student voice agendas. It would be possible to explore how these changes in the classroom linked up with changes at school/organisational level.

ABOUT THE ENQUIRING MINDS RESEARCH PROGRAMME

The materials in this guide have been developed from a three-year research and development programme funded by Microsoft's Partners in Learning programme.

This means that the guide is based on an intensive period of development and experimentation in two schools. We established student research groups in both schools who provided details about their own experiences and advised on what a curriculum that started from their concerns would contain. At the same time, we worked with a group of 10 teachers to explore what an approach that started with students' knowledge and ideas would look like in schools. The teachers experimented with different approaches and we produced a 'curriculum framework' for a year's work in classrooms. Teachers trialled the approach in classrooms during the school year 2006-07. As researchers, we observed these lessons with the aim of understanding the challenges involved, as well as what worked and what didn't. We interviewed teachers and students about their experience of the Enquiring Minds approach.

We are aware that the vision of Enquiring Minds is ambitious, and requires significant changes in the ways that school curricula are organised, and the nature of classroom relationships. However, we are convinced of the potential of the Enquiring Minds approach to make a difference, and part of our role as researchers in the project is to understand how the approach impacts on students and teachers. This is why, along with this guide, we are publishing an interim report on the project's work in two schools. This is available on the Enquiring Minds website at www.enquiringminds.org.uk.

FURTHER READING

Finally, we thought it would be useful to refer to some of the books that were helpful in developing the Enquiring Minds approach.

Catherine Burke and Ian Grosvenor (2003). The School I'd Like. Routledge

David Buckingham (2003) Media Education: Literacy, Learning and Contemporary Culture. Polity

Gwyn Edwards and Vic Kelly (eds) (1998). Experience and Education: Towards an Alternative National Curriculum. Paul Chapman Publishing

Michael Fielding and Sara Bragg (2003) Students as Researchers: Making a Difference. Pearson

John MacBeath, Helen Demetriou, Jean Rudduck and Kate Myers (2003) Consulting Pupils: A Toolkit for Teachers. Pearson

Nicola Madge (2005). Children These Days. Policy Press

Moseley, D et al (2005). Frameworks for Thinking: A Handbook for Teaching and Learning. Cambridge University Press

Bill Osgerby (2004). Youth Media. Routledge

John Quicke (2000). A Curriculum for Life. Open University Press

Jean Rudduck and Julia Flutter (2004). How to Improve your School: Giving Pupils a Voice. Continuum

Tracey Skelton and Gill Valentine (1998). Cool Places: Geographies of Youth Culture. Routledge

Chris Watkins, Eileen Carnell and Caroline Lodge (2007) Effective Learning in Classrooms. Paul Chapman

Chris Watkins. Classrooms as Learning Communities: What's in it for Schools? Routledge

John White (ed) (2005). Rethinking the School Curriculum. RoutledgeFalmer

ABOUT MICROSOFT

Every child should have the opportunity to realise his or her full potential in the classroom, at home, and in the world at large. Empowered with the knowledge and skills that can only come from a good education, individuals are better equipped to enjoy a more fulfilling life and to thrive in the digital workplace. Microsoft believes that technology can be a powerful catalyst to improving teaching and learning for all and that we should play our part in broadening access to ICT and engaging and empowering students and teachers to use technology in creative and innovative ways. Through its Partners in Learning Programme, Microsoft has formed partnerships with Futurelab as well as with the Training & Development Agency for Schools; the Scottish Qualifications Authority; and National Assembly for Wales. These partnerships will help give today's children the best possible start in life.

The Partners in Learning programme is designed to improve access to, and better use of, ICT in education. The programme already provides a wealth of resources and tools for teachers and schools. Further information can be found at www.microsoft.com/uk/education/PartnersinLearning.

ABOUT FUTURELAB

Futurelab is passionate about transforming the way people learn. Tapping into the huge potential offered by digital and other technologies, we are developing innovative learning resources and practices that support new approaches to education for the 21st century.

Working in partnership with industry, policy and practice, Futurelab:

- incubates new ideas, taking them from the lab to the classroom
- offers hard evidence and practical advice to support the design and use of innovative learning tools
- communicates the latest thinking and practice in educational ICT
- provides the space for experimentation and the exchange of ideas between the creative, technology and education sectors.

A not-for-profit organisation, Futurelab is committed to sharing the lessons learnt from our research and development in order to inform positive change to educational policy and practice.

futurelab

ALSO FROM FUTURELAB:

Literature Reviews and Research Reports
Written by leading academics, these publications provide comprehensive surveys of research and practice in a range of different fields.

Handbooks
Drawing on Futurelab's in-house R&D programme as well as projects from around the world, these handbooks offer practical advice and guidance to support the design and development of new approaches to education.

Opening Education Series
Focusing on emergent ideas in education and technology, this series of publications opens up new areas for debate and discussion.

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We hope that this guide will encourage teachers and schools to take up and develop some of the ideas associated with Enquiring Minds. We would like to see a network of schools developing, trialling and sharing the approach. We would be very happy to discuss the ideas further, and hope to work closely with a number of schools to extend the project.

GETTING INVOLVED

We can be contacted at **enquiringminds@futurelab.org.uk**.

"I think you've got to start with a small group of people who are going to be really committed to doing it and can see the value in doing it. I think getting a team of people from across different subjects works really well."

Teacher

"Sometimes it was fun and sometimes it was quite frustrating, because you just wouldn't get anywhere sometimes in lessons. But then other lessons you'd get really far on your own and feel really proud of yourself."

Student

www.enquiringminds.org.uk