Action Enquiry for School Improvement

Linking Success Criteria to Self and Peer Assessment in Maths

Kathryn Soulard, 2007-2008

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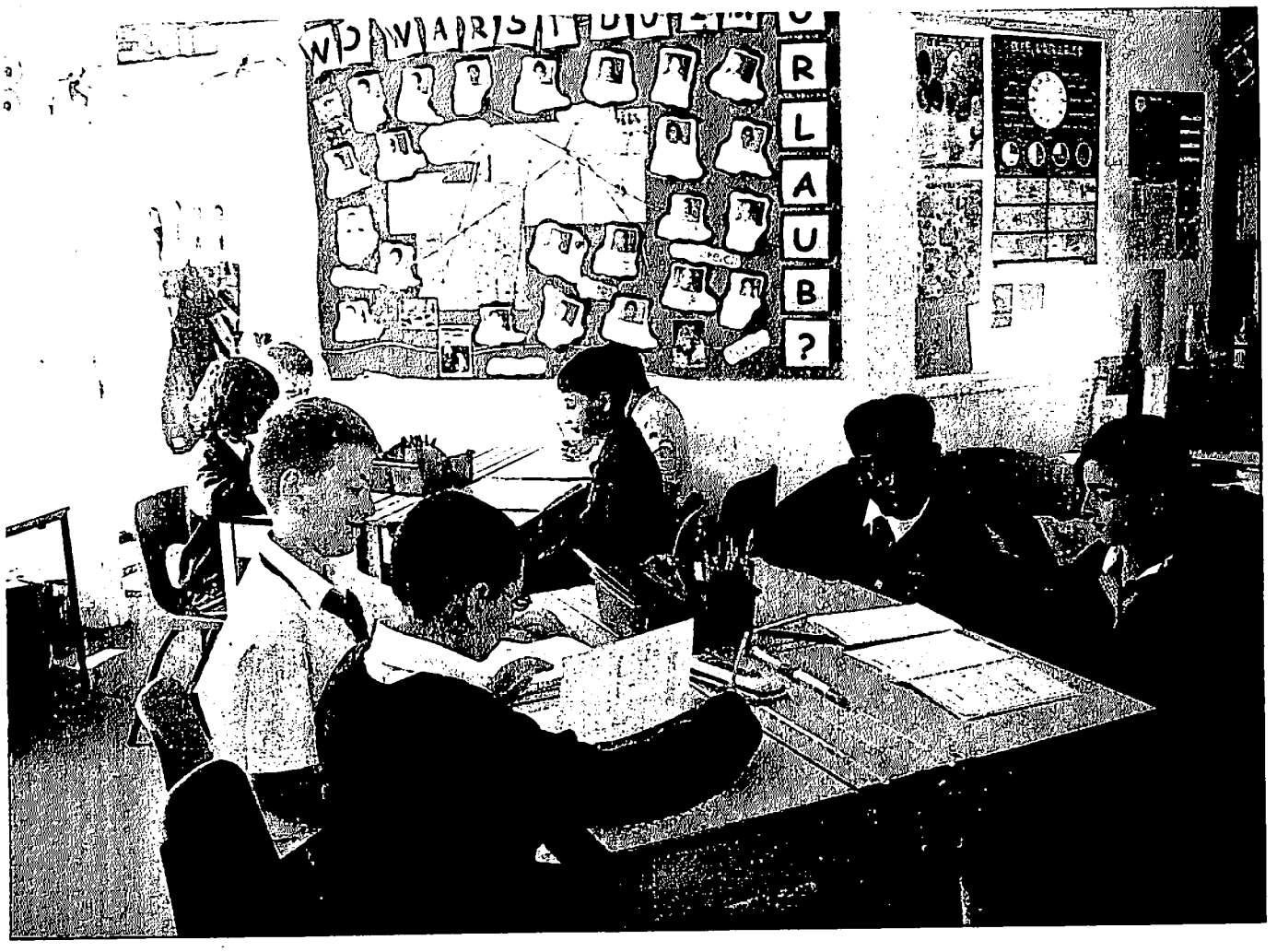
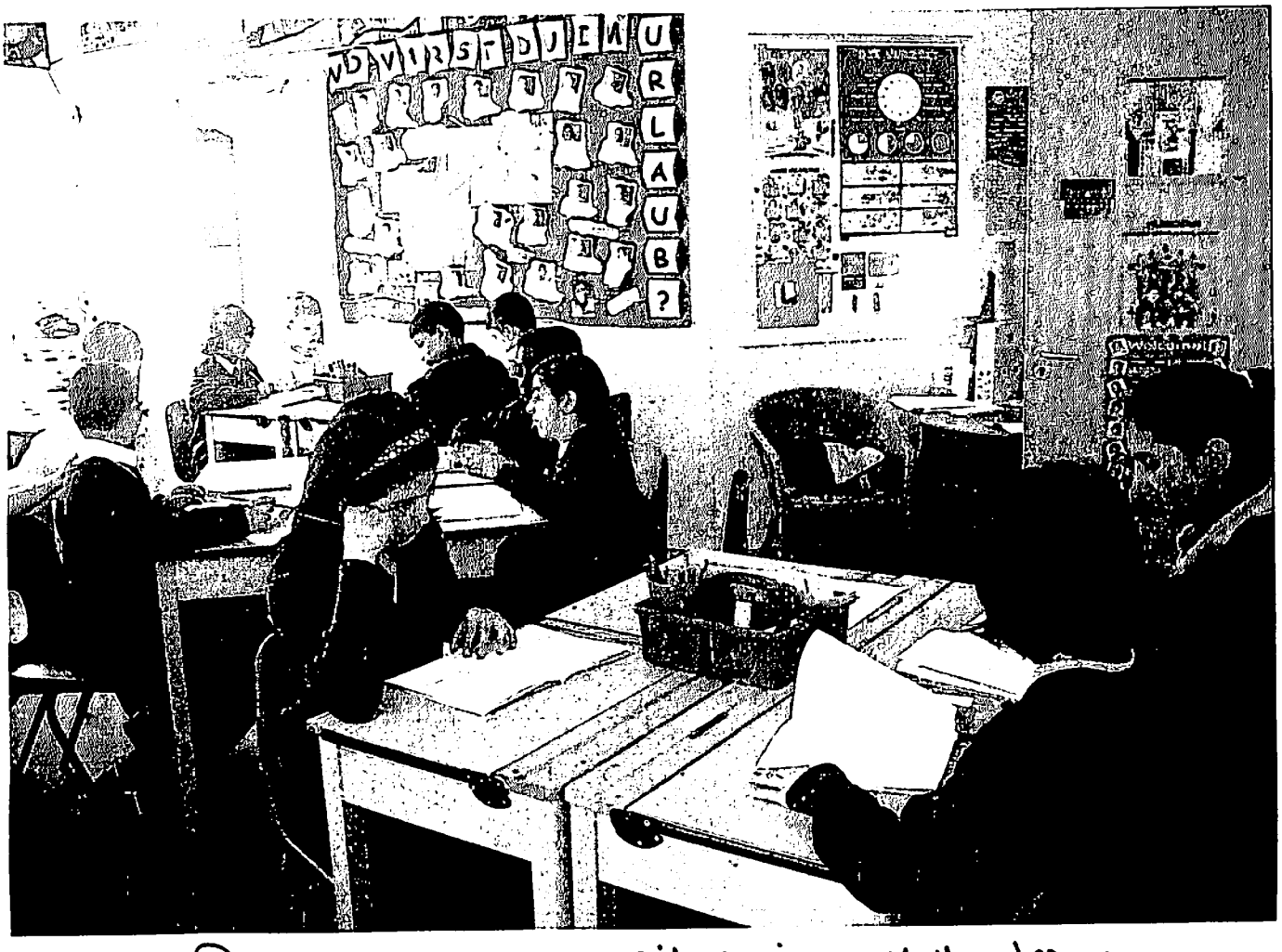
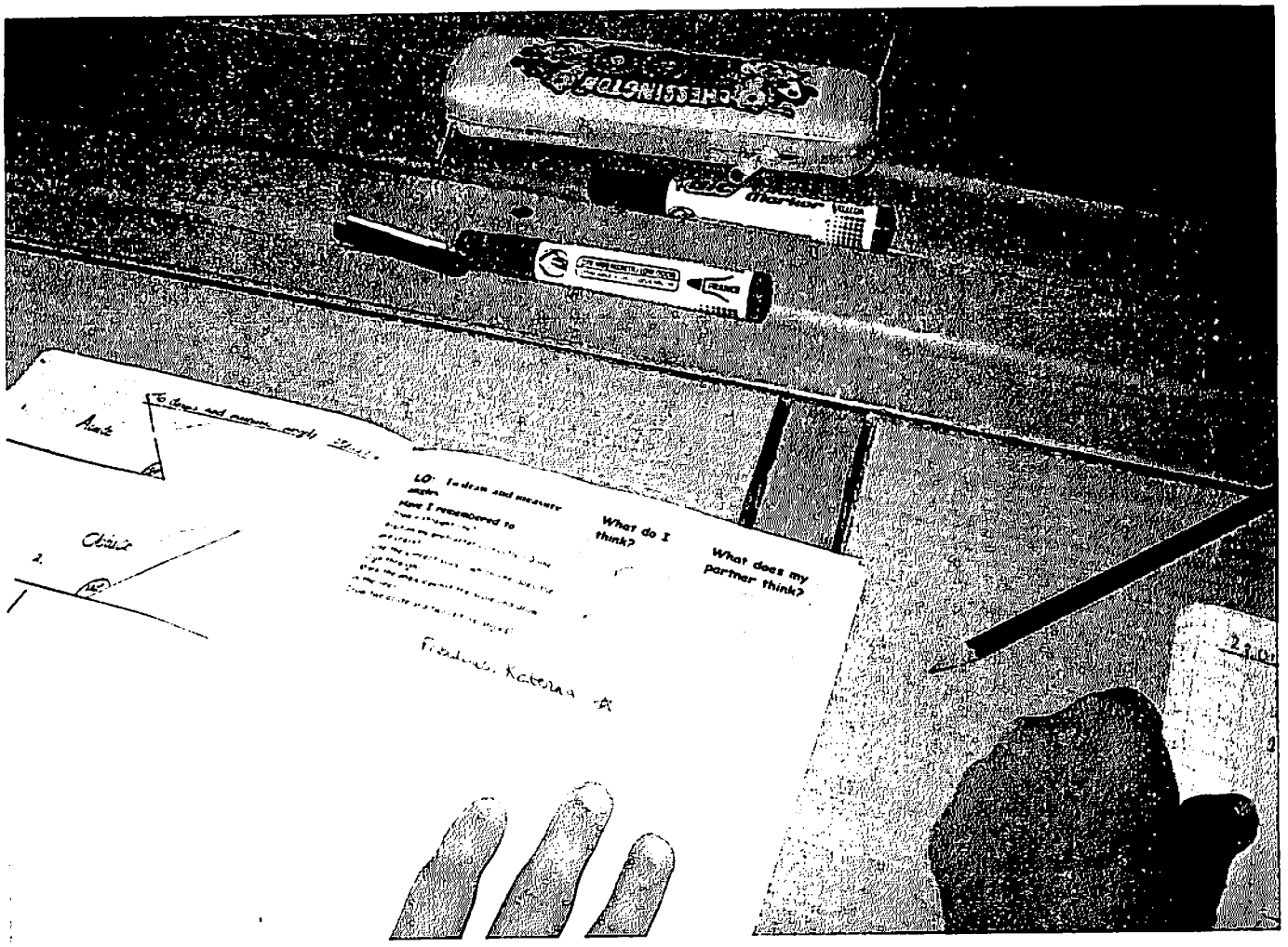




Pupils using success criteria in a Maths lesson (plenary) for self and peer assessment.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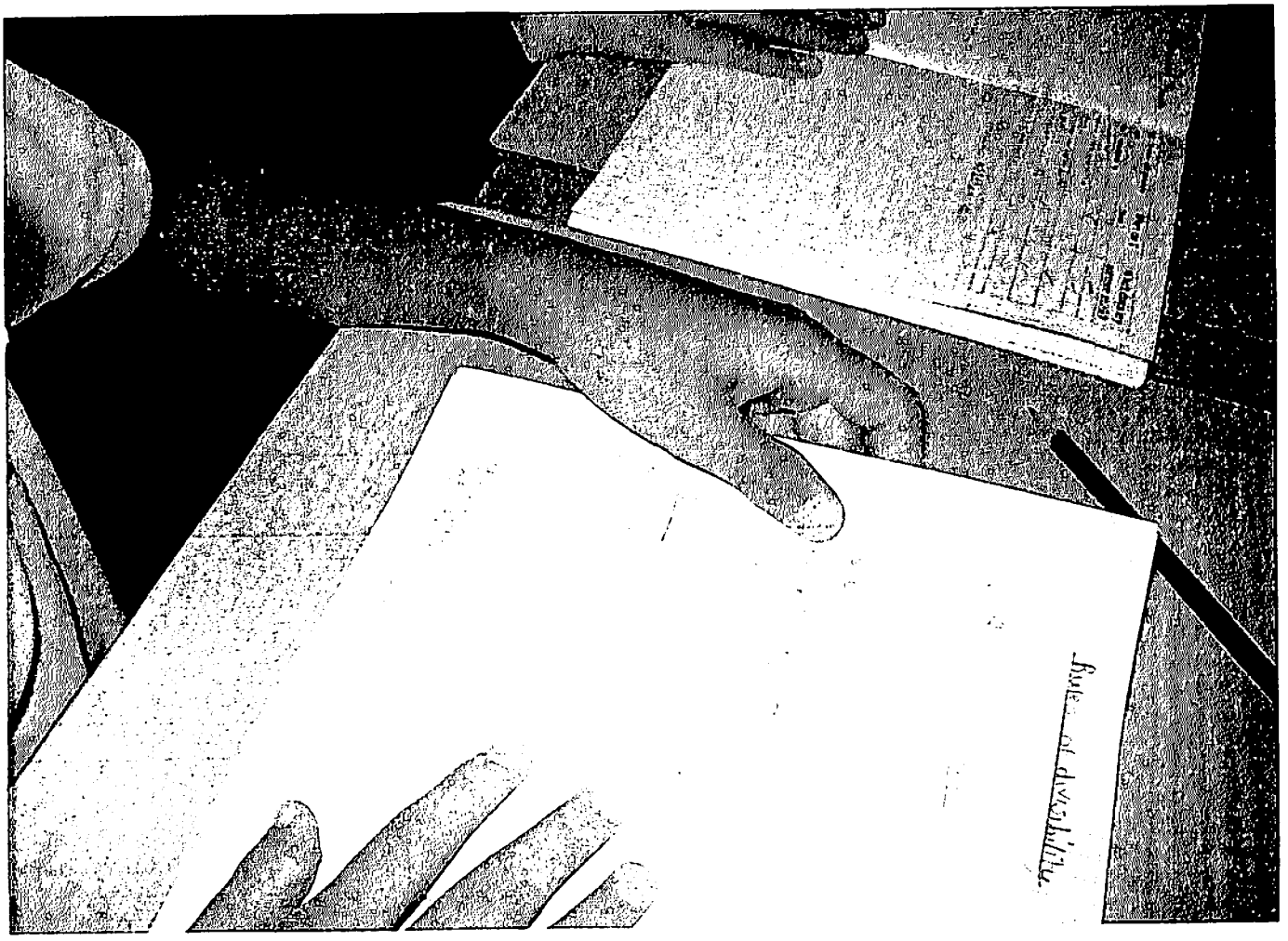


Introduction, focus and overview

Linking Success Criteria to Self and Peer Assessment in Maths

Kathryn Soulard, October 2007

I am the Maths Subject Leader at Oakthorpe Primary School, a multi-ethnic primary school in north London, with 481 pupils on the roll. We are two-form entry, split across three classes; consequently class sizes are no more than 24.

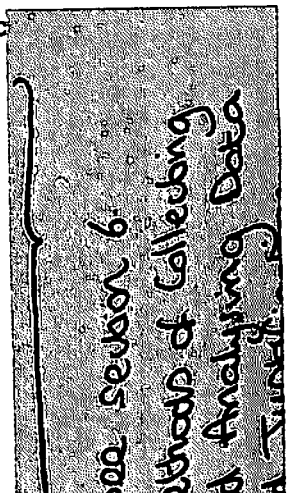
SATs results in Maths in 2006 were 98% Level 4+, reducing to 83% in 2007.

Children are split into ability groups for Maths from Year 1 and I will be basing my research within a Year 6 group of 21 middle ability children – all currently working at NC Level 4c/4b. There are 11 girls and 10 boys from a variety of social, ethnic and religious backgrounds. Teaching is supported by a full-time teaching assistant and a trainee teacher, in class three days a week – with increasing teaching responsibility.

In September 2007, we introduced the Renewed Framework for Mathematics (2006), which places much greater emphasis on three key areas:

- using and applying
- talk for learning
- assessment for learning

It is on this latter aspect of the Renewed Framework that I plan to focus my research – specifically on the use of success criteria, which I plan to link to self and peer assessment in Maths.



I would like to identify whether using success criteria in Maths has an impact on:

- children's cognition of their own learning
- their ability to identify areas of weakness and seek help (either independently, from a friend or from a teacher)
- attainment.

Further, I would like to explore whether linking the use of success criteria to self and peer assessment in Maths enables children to:

- track their own progress, thus improving their cognitive development and attainment levels.
- be more responsible for their own learning
- have a better self-image in relation to maths and their mathematical ability.

Success criteria are used as standard throughout the school in Literacy. In teaching Literacy, I have found that providing children with specific success criteria in relation to written work enables them to focus their efforts. Encouraging them to peer or self assess this piece of writing enables them to identify areas of success and weakness and highlight areas to work on next time.

From this prior experience, my hypothesis is that children will have a much greater awareness of their own strengths and weaknesses in mathematics, which will enable them to seek support (either independently or from a teacher/friend), thus improving their attainment. I also strongly believe that being aware of their own ability and celebrating their successes will boost their self image per se and in relation to maths specifically.

Clearly there are other factors, which will have an impact during the course of this research, for example:

- other pedagogical strategies – eg. talk partners, paired problem-solving
- the breadth of the taught curriculum

These will need to be considered in the light of any conclusions I am able to draw.

However, should my hypothesis prove correct, I would like to roll out the consistent use of success criteria in Maths to the rest of the school, as a means of improving pedagogy and standards. Further, I would hope that demonstrating the benefits of linking success criteria to self and peer assessment would encourage the greater use of this method of formative assessment by colleagues, not only in Maths, but across the curriculum.

Timeline - Kathryn Soulard
Action Enquiry for School Improvement
October 2007

October 2007	Complete Overview and Needs Analysis
November 2007	Develop Professional Autobiography and Critical Review of Literature
December 2007	Begin to gather attainment data (pre-research) and consider research tools to use. Develop lesson plans/examplar materials to use during research phase.
January 2008	Consider Action Research methodologies. Begin research phase - approximately 11 weeks - 7 January to 4 April (excluding half term, bank holidays and Inset).
February 2008	Research phase.
March 2008	Research phase.
April 2008	Begin data analysis.
May 2008	Develop thoughts on the Impact of the Action Research.
June 2008	Complete Evaluation.
July 2008	
August 2008	
September 2008	Submit project.

Needs Analysis

Linking Success Criteria to Self and Peer Assessment in Maths

Kathryn Soulard, November 2007

Since 1997, when Labour gained power, we have seen the introduction of:

- a new National Curriculum
- National Numeracy and Literacy Strategies
- Renewed Numeracy and Literacy Frameworks (2006)
- standardised assessment tests

– all of which were introduced with, apparently, one purpose in mind – to raise standards.

Currently high on the government's agenda are:

- Every Child Matters
- Personalisation
- The Renewed Frameworks for Mathematics and Literacy
- New Teaching Standards

The government's Every Child Matters (2003) agenda is a direct response to the Victoria Climbié tragedy, setting out a vision of all relevant professionals working together to ensure that all children:

- stay healthy
- be safe
- achieve and enjoy
- make a positive contribution
- achieve economic well-being

Central to ensuring that all children reach all of these targets is the notion that all children will thrive at school, enjoy their experience at school and make good progress.

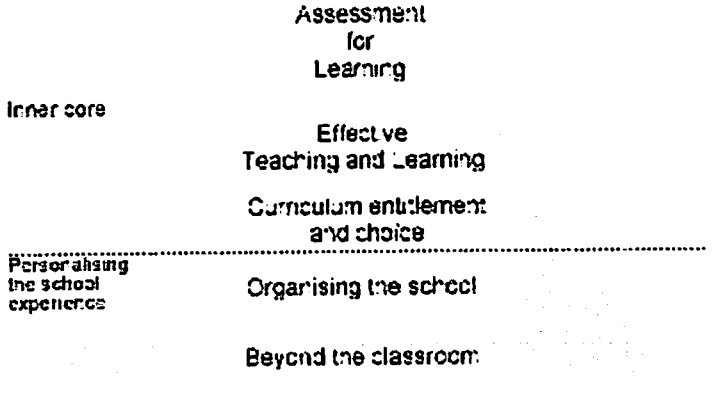
"Personalisation", first mentioned by Prime Minister Tony Blair at the 2003 Labour Party conference, is the current educational buzz word.

The emphasis with both ECM and Personalisation is that the needs of individual pupils must be met. However, since this concept is not new, what exactly is personalisation?

The 2020 Vision Report to Ministers of the Teaching and Learning in 2020 Review Group states:

> "Personalised learning does not depend on individual learning programmes for each pupil in the class. It requires effective whole class interaction, with good use of questions and fielding of pupil responses ... above all, it means good assessment for learning, since this is a key to tailoring teaching and learning more closely to pupils needs, with planning to objectives, a clear sense of subject progression, oral and written feedback ... and pupil peer and self-assessment."

So, it is more than just "differentiation", which relates more to ensuring that all children are able to access a particular lesson, whereas, in the above definition, personalisation is more a combination of:



At the heart of personalisation, therefore, its thrust if you like, is Assessment for Learning (AfL) – allowing children, as I see it:

- to understand what they are learning
- why they are learning it
- what they need to do to be successful
- to reflect on their successes, and
- address any gaps

Precisely what I am hoping to achieve in Maths by linking success criteria to self and peer assessment.

The 2020 Vision model was earlier (June 2004) supported by Ray Tarleton, National Co-ordinator of NCSL's Leadership Network in its Personalised Learning Supplement:

> "In simple terms it is about the combination of these elements: assessment for learning, classroom practice and curriculum pathways, with school organisation and community links as important features."

Again, the aim of the Renewed Framework for Mathematics is "to increase all children's access to excellent teaching, leading to exciting and successful learning." (Primary Frameworks website). The Framework states that children deserve:

- to be set appropriate learning challenges
- to be taught well and be given the opportunity to learn in ways that maximise their chances of success
- to have adults working with them to tackle the specific barriers to progress they face.

Furthermore, in a bid to standardise the quality of teaching and ensure that children do have access to "excellent teaching", the TDA have this year (2007) reviewed and updated the professional standards for teachers – from trainees through to excellent teachers.

The standards relating to AfL are covered in two separate sections – Knowledge and Understanding and Professional Skills. These updated standards are explicit and show progression from QTS through to the Core level for qualified teachers.

Professional Skills

QTS	Core	Post-threshold	Excellent
Q26 (a) Make effective use of a range of assessment, monitoring and recording strategies. (b) Assess the learning needs of those they teach in order to set challenging learning objectives.	C31: Make effective use of an appropriate range of observation, assessment, monitoring and recording strategies as a basis for setting challenging learning objectives and monitoring learners' progress and levels of attainment. C33: Support and guide learners so that they can reflect on their learning, identify the progress they have made, set positive targets for improvement and become successful independent learners.	Not specified under "Professional Skills".	E10 Demonstrate excellent ability to assess and evaluate.

However, after the Core level, the standards become somewhat less specific; unfortunate since the role of leading/excellent teachers should be as exponents of AfL. Nonetheless, I feel that the importance of AfL for teaching today is clearly highlighted in these new standards.

It is reassuring to note that ECM and indeed personalisation go beyond simply raising standards, focusing in equal measure on providing our children with a safe and secure education, which offers them a wide range of experiences. Higher standards continue to be the government's primary aim, though.

In its October 2005 White Paper - Higher Standards, Better Schools for All - More Choice for Parents and Pupils – Ruth Kelly, the then Secretary of State for Education and Skills asserted that:

" ... we must tailor education around the needs of each individual child – so that no child falls behind and no child is held back from achieving their potential."

From the above, I believe that the overriding theme of today's educational landscape is Assessment for learning – the idea that children who are involved in and responsible for their own learning will make progress.

As a school, we are also keen to raise standards. In part, this is to comply with government initiatives and targets, but also because as an institution and as individual professionals, we very much want every child to progress.

While, as a school we promote the use of AfL to move children on (see Assessment and Marking Policies – Appendix 1), evidence from recent marking monitoring suggests that this is perhaps sometimes more of an expectation than a reality in the core subjects. Furthermore, in terms of moving children on and ensuring progress, my recent analysis of tracking data in Maths has highlighted a lack of progress in lower KS2, which we are keen to address. Indeed, this is noted as an area for development in our SEF (self-evaluation form) – "improve Maths in KS2".

While our SATs results for Maths are consistently better than the Borough average and better than or in line with government targets (PSA target 2006 to 2008 is 85% - Standards website) ...

Year	Percentage L4+
2006	98%
2007	83%
2008 Target	93%

... given our target of 93% for 2008 (target specified to Borough), we cannot afford to be complacent.

As Maths Subject Leader I have recently introduced a range of measures designed to address the issues highlighted above:

* introduction of the Renewed Framework for Mathematics (2006) – a key priority in our School Development Plan 2007/2008 and one of my Performance Management targets
* supporting some teachers with planning to ensure an appropriate level of challenge
* reorganisation of Maths groups in some year groups to ensure more effective targeting by ability

"There is an ethos of success and life long learning is a reoccurring theme." (SEF)

But, I would like to explore other ways in which to encourage children to reflect on their own learning and areas for development as well as take responsibility for their own learning - partly to improve standards/ensure children make progress and partly to developing my own practice, as I believe that children should benefit from the best teaching available. Keeping up-to-date with developments in pedagogical thinking has already led me to embed a number of "good practice" initiatives into my teaching, including for example kinaesthetic activities, talk for learning and success criteria.

I am keen to discover whether my research in linking success criteria to self and peer assessment in Maths supports this.

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- 2020 Vision, Report of the Teaching and Learning in 2020 Review Group, January 2007, London
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- Personalised Learning, A Commentary by the Teaching and Learning Research Programme, 2004, London
- Personalised Learning, DfES website
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Professional Autobiography

Linking Success Criteria to Self and Peer Assessment in Maths

Kathryn Soulard, November 2007

I have been teaching for just over three having previously worked in commercial organisations for eighteen years.

My career prior to teaching was split between two organisations:

- Citibank, where I managed a department for the European division responsible for sales and expense analysis (7 years); and
- Informa Group, managing a department researching, producing and marketing financial markets conferences (11 years).

Currently, I am a Year 6 teacher, the Maths Subject Leader and a member of the Senior Management Team at Oakthorpe Primary School. Both these latter two responsibilities require me to be a role model for other teachers, develop and implement good practice, as well as giving me responsibility for children's progress in Maths across the school.

Additionally, I am a mentor for trainee teachers and NQTs, as a result of which I am extremely conscious that my practice should be "best practice". I also run Inset for existing teachers, support staff and trainees focusing on progression in maths.

I am conscious that the views and beliefs I bring not only to my research but also to my teaching are subjective, being influenced by:

- Background - working class and northern, giving me a strong work ethic and desire to succeed.
- Previous career, which was predominantly target-driven, with a strong emphasis in research and analysis.
- Gender - being a woman, and a mother, is hugely influential. While I don't have the stereotypical "nurturing" instinct, I believe very strongly that every child has the right to succeed and that all children have some talent which should be celebrated. I am also very conscious of, and question, inequality - particularly since even working in primary education (predominantly female), most senior roles are occupied by men.

I accept that my views – and hence my conclusions – will be subjective, but feel that they are nonetheless valid. My views on the need for, and benefits of, AfL developed prior to my becoming a teacher as a result of my son's experiences at primary school. Although he was of above average ability in maths, had an advanced vocabulary and was extremely articulate, he struggled with writing. In fact, he made no progress in writing between Years 2 and Years 5 and yet none of his teachers identified that he had any problems. Only a private assessment by an educational psychologist led to specific learning disability being identified. I am convinced that his experiences at school would have been entirely different, protecting and promoting his self-esteem and enabling him to make good progress, had more AfL taken place.

So the whole ethos of AfL and the process of self and peer assessment have always struck a chord with me, leading me to independent research and analysis throughout my career.

Specifically I have been influenced by the work of Shirley Clarke with regard to AfL and also by Roz Wilson in terms of strategies to improve standards in writing. Ms Wilson advocates very specific target setting to enable children to move forward and I have incorporated this into my AfL strategies in Literacy.

Having used AfL extensively in Literacy, integrating success criteria into lessons to provide children with a framework against which to assess their work, I am convinced that children are able to recognise and praise their own and other's achievements, while clearly identifying those criteria they didn't achieve. This, together with specific marking against the success criteria, gives them a clearly defined target for next time. In my experience, the less able are supported by AfL, while an appropriate level of challenge can be provided for the more able; ultimately all children are empowered to succeed.

However, I have never found it as easy to incorporate AfL as specifically within Maths. Success criteria *are more* difficult to develop and without these, the impact of self and peer assessment is limited.

As a school, while AfL is part of our Assessment and Marking policies, my observations of Maths lessons (and feedback from the Assessment Co-ordinator in general) suggest that while some AfL strategies are used in marking, the use of self and peer assessment strategies are limited – being limited currently to children marking their own work. While this may help children realise that they have made a mistake, I believe they are unlikely to understand where/how the mistake was made and are even less likely to appreciate how to put it right.

So, this is an area I would like to develop – particularly since a significant minority of our children fail to make the progress they should in maths from KS1 to KS2. If we could improve our practice related to AfL in maths – and for the time being I want to focus on linking success criteria to the self and peer assessment in the plenary – I feel sure that children would make significantly more progress.

Our last Ofsted inspection was in 2004, so we are currently feeling the pressure of an imminent inspection. My concern (in line with that of the Assessment Coordinator) is that our current practice in AfL may not be up to standard, which could lead to criticism in this area - particularly in maths.

I anticipate that my research into AfL/success criteria will not only improve my own professionalism and support my future professional development, but will also generate a platform for developing good practice in school – especially since being research-based it should lend more credence to my conclusions.

However, while I believe that the conclusions I reach will be positive – that linking success criteria to self and peer assessment in maths will improve children's confidence in maths, enabling them to be more independent and motivated learners and will improve their progress, I recognise that this is not an exact science and that there are many other factors which will also have an impact.

A Critical Review of the Literature

Linking Success Criteria to Self and Peer Assessment

Kathryn Soulard – December 2007

Assessment for Learning (AfL) is the "modern" term for formative assessment, which is defined by Black and Wiliam (1998) as:

"any form of assessment which provides feedback to students on their progress AND where this feedback is used to inform teachers' planning and teaching."

The Assessment Reform Group (1999) go further:

"Current thinking about learning acknowledges that learners must ultimately be responsible for their learning since no one else can do it for them. Thus assessment for learning must involve pupils, so as to prove them with information about how well they are doing and guide their subsequent efforts. Much of this information will come as feedback from the teacher, but some will be through their direct involvement in assessing their own work. The awareness of learning and ability of learners to direct it for themselves is of increasing importance in the context of encouraging lifelong learning".

Both of these definitions are supported and reinforced by Clarke (p.15 Formative Assessment in Action) as consisting of:

"four basis elements, underpinned by confidence that every chid can improve and an awareness of the importance of children's high self-esteem:

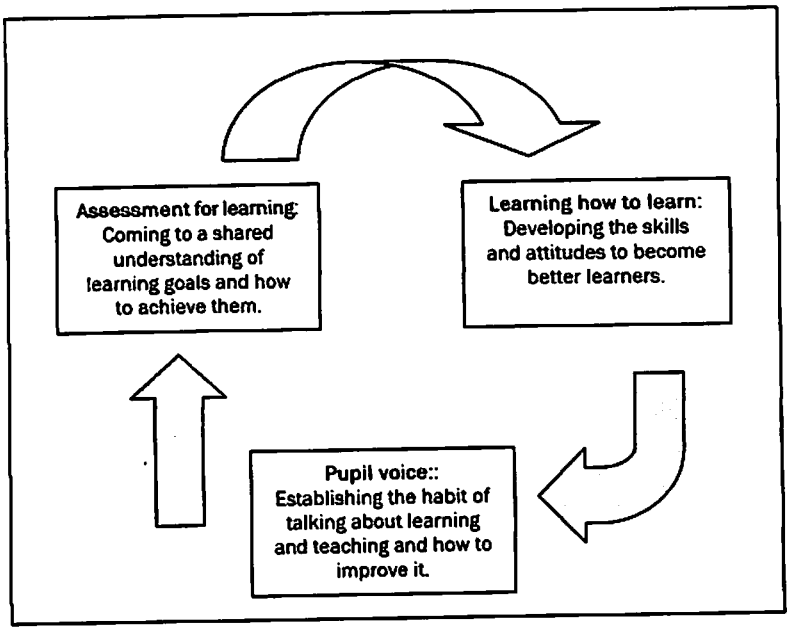
- sharing learning goals
- effective questioning
- self and peer assessment
- effective questioning"

In summary, then, AfL is not something to be "done" to children, but a dialogue between the child and others (peers, the teacher), which should enable all children to make progress – the two key words here being "all" and "progress".

History of AfL

Assessment in the modern context has moved away from purely summative assessment (testing, then re-testing), which was the focus until the mid 1990s, to focusing on formative assessment (also known as Assessment for Learning) or using summative assessment formatively (see the Framework website).

The main focus of summative assessment in primary schools currently is national testing at 7 (KS1 SATs – no longer published) and 11 (KS2 SATs). Interestingly, Middlewood et al believe that the government's emphasis on national testing and the publishing of school league tables has not only led to "teaching to the test" but also to children becoming "dependent" rather than "independent" learners. This is contrary to the present government's Personalised Learning agenda, which aims to encourage children to "take ownership of (their) learning" (2020 Vision p.20):



thus creating a dichotomy of ideologies.

Indeed, in their 2020 Vision report (p.18), the 2020 Review Group state:

> "We do not consider that national summative assessment and personalising learning are incompatible."

Weeden et al question the value of assessment for assessment's sake. They rightly point out that we gather huge amounts of assessment data about the children we teach, but unless we use this diagnostically either to address gaps in children's understanding and/or more them forward, it is little more than a pointless exercise.

While I concur with this view, the upside of national testing at KS2 has been to focus the minds of all stakeholders on ensuring that all children reach a certain standard in Maths, Literacy and Science. On the other hand, the downside has been a narrowing of the curriculum, particularly in Year 6.

Current Policy

The government's current foci are Every Child Matters (ECM) (2003) and Personalised Learning (www.standards.dfes.gov.uk/personalisedlearning).

Of the five strands of ECM, the latter three relate most obviously to AfL:

- ECM 3 – achieve and enjoy
- ECM 4 – make a positive contribution
- ECM 5 – achieve economic well-being

In terms of Personalised Learning, the DfES produced in September 2004, a new version of its five key components:

1. Assessment for learning and the use of evidence and dialogue to identify very pupil's learning needs;
2. Teaching and learning strategies that develop the competence and confidence of every learner by actively engaging and stretching them;
3. Curriculum entitlement and choice that delivers breadth of study, personal relevance and flexible learning pathways through the system;
4. A student centred approach to school organisation, with school leaders and teachers thinking creatively about how to support high quality teaching and learning;
5. Strong partnership beyond the school to drive forward progress in the classroom, to remove barriers to learning and to support pupil well-being.

Clearly, AfL is number one on the government's personalisation agenda and this push is given impetus by the 2020Vision Review Group (2007), who recommend that (p16):

- the government should take further action to ensure that assessment for learning is embedded in all schools and classrooms so that its benefits are fully realised;
- schools should identify their own strategies for embedding assessment for learning, reporting regularly to governing bodies on their implementation and effectiveness.

This is clearly in line with Ofsted's experience and thinking, since in their annual report (2007) under Teaching and Learning, they say:

> "In the most successful lessons ... teachers have high expectations and use assessment information ... to provide challenging tasks for all and so ensure that individual progress is rapid and secure."

Barriers to Effective Assessment for Learning

Best practice and reality do sometimes diverge. Going back to Clarke's definition of AfL:

- sharing learning goals
- effective questioning
- self and peer assessment
- effective feedback

I would assert that sharing learning goals is generally embedded in best practice, while the latter three, as well as the aspect which is the focus of my own research – success criteria, are attempted and aspired to, but not always achieved. Lack of time is one issue, but more crucially, I feel, given the relative "newness" of AfL, is a lack of knowledge and expertise.
This lack of knowledge and expertise has become more apparent to me recently, during lesson observations, where frequently there has been a confusion by the teacher between success criteria, learning outcomes and assessment criteria.
In its Annual Report (2007), Ofsted also note that:

> "Many teachers still struggle to use the information from assessment to plan work that is well matched to the pupils' needs and to involve the pupils in assessing their own work."

In addition previous "accepted practice" can be more of a hindrance than a help. Indeed, Black and Wiliam highlight a dichotomy within assessment. The ultimate user of formative assessment is the pupil- in order for them to improve their own learning. If however they are more concerned with their grade or gold stars, etc, then pupils are more concerned with improving their "mark" rather than improving their learning.

This view is backed in a study by Ruth Butler (1988) in Israeli schools, which has shown that:

"pupils who are given only written or spoken comments on how they can improve their work and are not given marks or grades make greater learning gains than pupils given marks or grades only. Those given a combination of both marks and comments, which is possibly the most widely used form of feedback in our education system, make less progress than those given only comments."

(QCA Assessment for learning: using assessment to raise achievement in mathematics at key stages 1, 2 and 3, *p.15)*

My own experience concurs with both of these experiences since, previously when I gave formative feedback in Literacy, children in my class tended to ignore the comments, suggestions and corrections – unless specifically directed to read them, concentrating instead only on "house points", which we use as a reward/incentive. As a result, I no longer use "house points" as a reward in the core subjects of Literacy, Maths or Science.

Furthermore, Clarke and Weeden both point out separately that formative assessment if used incorrectly can be a negative factor. Children who are constantly singled out for additional support (p.13, Clarke, Enriching Feedback in the Primary Classroom) for example, recognise early on that they are not as "clever" as other children and perhaps more significantly, other children recognise that these are the "less able" children. Furthermore, if comments at the end of a piece of work are vague or negative, children who have perhaps tried hard, will become demotivated.

So, as teachers, we need to think clearly about the purpose of AfL and the most effective way in which we can use it to develop children's independence, ensure they make progress and (crucially) increase their self-esteem. Used effectively, formative assessment requires teachers to adjust their planning and teaching to reflect/meet the needs of the children (Weeden et al).

<u>Best Practice</u>

Since my focus is the link between success criteria and self and peer assessment, I plan to focus my comments under "best practice" in those areas, whilst nonetheless touching on those other elements of AfL, which as a whole constitute best practice.

- Success Criteria

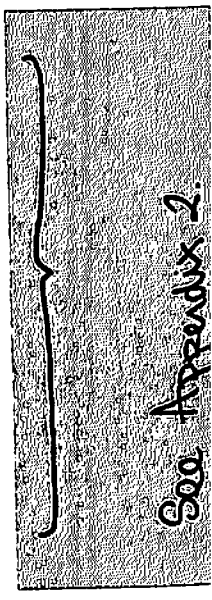
  Shirley Clarke (Formative Assessment in Action, p.37) states that:

  "Planning success criteria makes planning the activity easier, because the success criteria form the essential ingredients for modelling and teaching. Once children have access to the success criteria, they have a framework for a formative dialogue, with either partners or teachers, which enables them to:

  - ensure appropriate focus
  - clarify understanding
  - identify success
  - determine difficulties
  - discuss strategies for improvement
  - reflect on overall progress

  This key element of "dialogue" is highlighted by the Assessment Reform Group (2002):

  "Communicating assessment criteria involves discussing them with learners using terms that they can understand, providing example of how the criteria can be met in practice and engaging learners in peer and self-assessment."



Clarke (p.52 Formative Assessment in Action) further asserts that "children need to be involved in the generation of success criteria in order to most effectively own and access them."

This view is backed by Dean (p.2), stating that children "need to learn to judge their own performance against appropriate criteria they have been involved in defining".

Having involved children in this process in Literacy, it is clear to me that given a little practice this does indeed work and, more importantly, helps children to remember the key elements of what they need to include.

Further elements of best practice in terms of success criteria are:

- creating success criteria around the process so children can develop core skills.
- feedback should therefore focus more on the skills used, rather than information found or answers given.
- success criteria can be prefaced with "Remember to include"
- highlight one or two success criteria as a focus for improvement.
- aim for "open" rather than "closed" skills.

Importantly, Clarke maintains that success criteria should be the same for all children on the basis that if they are all "ordering numbers from smallest to largest" for example, the success criteria might be to start with the smallest number, to identify the most significant digit, etc. The fact that each group of children has a different set of numbers is therefore irrelevant.

- Self and peer assessment

Black and Wiliam (1998) assert that self and peer assessment is a way of enhancing formative assessment:

"... Pupils are generally honest and reliable in assessing both themselves and one another; they can even be too hard on themselves. The main problem is that pupils can assess themselves only when they have a sufficiently clear picture of the targets that their learning is meant to attain... When pupils do acquire such an overview, they then become more committed and more effective as learners. Moreover, their own assessments become an object of discussion with their teachers and with one another, and this discussion further promote the reflection on one's own thinking that is essential to good learning."

Once more then, the key element of discussion and dialogue is reaffirmed.

In line with the recommendations of the 2020 Review Group, Middlewood et al believe that not AfL should be a whole school ethos and that a learning school should "have a commitment to self-assessment and peer assessment alongside the provision of accurate data and comprehensible criteria ... "

Weeden et al suggest that the role of self-assessment is to encourage children to become independent learners. They add that children need to share responsibility for their own learning and be actively involved in it.

All of these views - Black, Wiliam, Middlewood, Weeden, etc - are firm in the belief that children need to be involved in their own learning, take responsibility for their own learning and, in fact, are very good at identifying areas of weakness and where they can develop. While I agree with this, I nonetheless feel that children have to be "trained" in this from an early age to enable them

to understand how to be active/independent and what to look for in terms of self assessment. They also then need to be given the opportunity to "self improve" independently. Again, this promotes the need for AfL to be embedded across the school.

Further elements of best practice in terms of self and peer assessment are:

- Feedback should be focused on the learning objective and the success criteria
- The aim of the feedback should be to "close the gap" or give specific suggestions for improvement.
- Children must have time to make the improvements suggested
- Use a "traffic light" system to highlight where there are misconceptions.
- For self-assessment children should:
  - Identify their successes
  - Identify a place for improvement
  - Make an "on the spot" change
- In peer assessment children should:
  - Work with a response partner of roughly the same ability

Crucially, Middlewood et al believe that for self-assessment to be effective, children need to be encouraged to admit difficulties without any risk to their self-esteem.

- Effective Feedback

According to Sadler (1989) "The learner has to (a) possess a concept of the standard (or goal, or reference level) being aimed for, (b) compare the actual (or current) level of performance with that standard, and (c) engage in appropriate action which leads to some closure of the gap."

In order to be able to do this, effective feedback is crucial – either from a peer or the teacher, whether verbal or written. Clarke (Formative Assessment in Action, p.9) concurs, starting that "pairs might make sure they have included everything (in the success criteria) but then work together to improve one element in their work.

However, analysis from the Learn Project, set up by the Centre for Assessment Studies based at Bristol Unversity School of Education, found that lower achievers are most at risk from ... inadequate feedback via formative assessment. Often these lower achieving children do not use feedback effectively and have a poorer understanding of assessment requirements than their peers.

This is perhaps related to language and the ability to use language to access information, but should be borne in mind by teachers when giving feedback.

- Teaching and learning

Talk:
Integral in the process of understanding the task in hand is being able to talk about it, using subject-specific vocabulary. The use of talk partners is not new, but not only enables children to formulate their ideas "before risking them with the rest of the class" (Clarke, p9, Formative Assessment in Action), but also gives them the "opportunity to discuss what they are learning and used to the language of learning and indeed subject-specific language" (Middlewood et al).

Talk in Maths about mathematical concepts and learning and using the language of maths is also crucial to developing and consolidating children's understanding of maths. Clarke and Atkinson

suggest "using group and paired work and using games in which talk is an integral part". (Supporting Significant Achievement in Mathematics, p.29)

Ability:
Shirley Clarke and Sue Atkinson make the very interesting observation that by Year 6 "there exists an ability range of no less than seven years" (Supporting Significant Achievement in Mathematics. p. 26) between the most and least able in a class.

Clearly, therefore, differentiation is vital. In some subjects, Literacy, for example, I believe that this can be achieved within a whole class environment - and indeed is beneficial to the less able, who profit from the ideas of those more able pupils, but I am less convinced of this approach in Maths. It seems unlikely that the needs of every child, where a seven-year ability range exists, could be taught the same mathematical concept at the same time. The decision therefore to split children into ability groups, or not, is also crucial. I firmly believe that splitting the children in to ability groups in Maths is vital to ensure that the children are working at the correct pace for them, are challenged effectively and can make good progress.

Conclusions and Ways Forward

Most of the research I have seen and read relating to formative assessment and the use of success criteria centres around Literacy. I think this is primarily because it is far easier to produce a set of success criteria which are effective, linked to a written task, than it is to a numeric or science-based task. This highlights for me the challenge for maths. I know that even within the London Borough of Enfield, there is little information available on the use of success criteria for Maths, nor have I found very much evidence on a thorough "trawl" of the internet on the use of success criteria in Maths either.

Moreover, in my own experience as Maths Subject Leader carrying out lesson observations, I have yet to see Success Criteria which have either been correctly formulated (often they are confused with learning outcomes or assessment criteria) or correctly used (not made clear to children, not referred to during lessons, not promoted as a means of self or peer assessment).

As a result, to ensure that my own research has meaning, I will need to consider:

- the type of feedback I give both oral (during the lesson) and written (in marking notes after a lesson).
- how the success criteria are structured.
- how I use the success criteria effectively throughout the lesson and during the plenary for self and peer assessment.

Often, within schools, lesson times are reduced or teachers feel pressured to fit in more and more content to already packed lessons. As a result time for self and peer assessment is not available, so I will also need to ensure that for the self and peer assessment to be meaningful and productive, I allow sufficient time within a lesson/plenary to allow this process to be successful.

I will also need to ensure that, since this will be a new experience for many pupils, I clearly explain the process and the aims of the self and peer assessment process and support those less able pupils so they gain the maximum benefit.

Depending on the results of my research, I hope to disseminate this as best practice across the school. There are a couple of issues I foresee here which would need to be addressed before implementation:

- While learning objectives are usually reasonably easy to determine, teachers find success criteria much more complex to develop, particularly in Maths. If the success criteria being used are

ineffective, then peer and self-assessment are unlikely to be effective. Training would need to be given.

- There is a risk that some teachers might see peer and self-assessment as an alternative to their own marking and assessment, when clearly it is not. Again, this would need to be made clear.

- To be effective as a whole school ethos, commitment has to be in place from Senior Management and individual teachers across the school. In that way, children will be exposed to self and peer assessment from an early age and will become more adept as they progress through school.

The literature available has been helpful to set my own approach into context and clarify existing best practice with regard to AfL. However, as far as I have been able to determine there has been no specific study in maths relating to the link between success criteria and self and peer assessment; consequently I am keen to develop this.

See Section 9.

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Linking Success Criteria to Self and Peer Assessment
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A conceptual model of Assessment for Learning derived from the literature and research