

GATSBY TEACHER FELLOWSHIPS (GTF) PROGRAMME NEWSLETTER

NOTE FROM THE EDITOR

I recently attended (and edited) the Design and Technology Association (DATA) international research conference and believe that there is a desperate need for practicing teachers to formalise and validate the extension of new knowledge. There is often reluctance from teachers to extend their work and attempt to validate their claims about curriculum development. Yet without validating our findings or disseminating our work beyond our immediate associates we will constrain the development of all our subjects. I hope that all Gatsby Teacher Fellows will regard dissemination of their project work an even higher priority.

David Spendlove
Liverpool John Moores University
Editor, 1999-2000 Fellow

CAD CAM COOKIES PLATINUM

Last year's CAD CAM Cookies CD ROM was shortlisted for a 2003 BESA Award. It didn't win but that didn't matter, as it was great to be up there with the likes of Lego Dacta, Granada and Channel 4. Also Tom O'Connor hosted the evening and he was fantastic. I don't know how I made it through the night! I wrote down the jokes on the back of the menu and have relied on them ever since, still smeared by the tears of laughter.

This year I chose to diversify and produce CAD CAM videos and software tutorials for Art & Design, Food Technology and Product Design. To avoid confusion between the different versions of previous discs I called it CAD CAM Cookies Platinum Edition. The projects were tested many times to make sure that they worked before filming began. Having access to videographer Martyn Harris really made the difference. Filming was over several months and eventually there was enough footage for the final edit. I was particularly proud of the first twelve seconds of introductory video compiled on the home PC in the confines of a small built in wardrobe in a desperate attempt to hide. That really is another story!

The tutorials were created using the new version of Camtasia and the music was dubbed on afterwards. Trying to record learning tutorials in absolute silence is a task in itself and near impossible. I found recording from inside the car parked in the garage was ideal as long as hypothermia could be avoided. I have tried to create a different feel to the disc and have worked on intuitive navigation with students as the disc developed. CAD CAM Cookies Platinum has enjoyed a bit of publicity and hopefully I will get to produce another in the series using lasers and four axis during 2003-2004. The Design and Technology Association are publishing CAD CAM Cookies Platinum Edition for release in September. Thanks Gatsby!

Jonathan Boyle, The Walsall Academy
2001-2003 Fellow

PHYSICS DATABASE

The main aim of my project for this year was to produce a version of my Physics Database, which would have a virtual walkthrough linking to the items in cupboards and shelves, which you would select during the walk, and select how they would be used in experiments. In order to do the latter the idea was to have experiment sheets for teachers, technicians and pupils in each year group for each topic, which would be embedded into the database.

Having tried 4 versions of the walkthrough, with little success in each case, using every free software option that we could think of, I finally decided that it was better to leave this type of work to the 'graphics boffins' employed by Sony Playstation et al.

Also, as the work progressed I was very keen to link our database into a web accessible format since we already have much of our Dalriada Physics work online via the school website. None of the 4 prototype virtual walkthroughs could run easily via the school site nor could the Database in Access 2000 be accessed via the web.

Finally, in desperation, I took a bottom up approach and on the advice of my mentor, Sandra Amos, decided to discard the walkthrough completely and concentrate on having a Physics Database that:

1. Could be accessed and managed (if necessary) via the web.
2. Could have experiment sheets with equipment pictures linked to individual items and locations and vice versa.
3. Could be used to facilitate resource management and ordering.
4. Could be replicated free by anyone who so desired by down-loading;
 - (a) Apache as the web server
<http://httpd.apache.org>
 - (b) My SQL as the database
<http://www.mysql.com>
 - (c) PHP to build the web pages in HTML or PHP –
<http://www.phphelp.com>
5. Could import across our current Access Database relatively easily.
6. Could facilitate the easy construction of Interactive White Board lessons, in the future, by providing material via the pupil experiment sheets for insertion into interactive power point templates.
7. Could provide a mechanism for the management of ICT learning resources, in the future, such as CD ROMs or other programs, which could also feed into point 6 above.

In terms of my achievements this year, these have been to carry out the first 5 points outlined above, on a prototype basis, for one topic, for one year group and to set up a framework for future work which would enable full implementation of points 1-5 on a topic by topic year group by year group basis as well as points 6 and 7 as outlined above.

My fellowship outcome has been specifically for year 11 Experiments on Earth in Space for GCSE Physics. The equipment listed in the sheets is directly linked to the database. For example, in the experiment to measure mass using a "wig-wam" machine, clicking on that phrase will take you straight to the database which will indicate to teachers/technicians/pupils, how many of them there are, where they are kept etc.

It had originally been my intention to have the picture of the equipment embedded into the database, but it has proven to be much more useful to have a full size picture/pictures of the equipment, as used in the experiment as

P2 of 2 of each of the experiment sheets. To that end I have done just that; inserted the equipment pictures into each experiment sheet. While this results in duplication it has also overcome the greater problem; that pieces of equipment could be used for many different experiments over several 'topic areas', so we have taken pictures of the experiment set up and pulled the individual pieces of equipment out, tied to number/locations etc, via the database. This has solved what would otherwise have been a major problem.

In conclusion, over what has proven to be a very difficult year we now have a database, transferred from Access to My SQL using PHP as a prototype, that fulfils all of my original criteria, and many more besides, except for the virtual walkthrough which will, for the meantime, have to remain a pipedream.

**Denise Gault, Dalriada School
2001-2003 Fellow**

LESSONS USING POWERPOINT

In February 2001, St Cyres School was successful in winning a WSSA (Welsh Secondary Schools Association) curriculum award for work on a European project. We were invited to a local hotel on the outskirts of Cardiff for the award ceremony. Each of the winning schools were invited to take a small team of students to make a presentation. PowerPoint was new to us and as we wanted to give a good impression, we constructed a presentation and the pupils diligently rehearsed their speeches to go with it.

I checked with the organiser that PowerPoint would be available and he assured us that he had checked with the hotel and that all was ok. We took our presentation with us on a floppy disc. When we arrived, I asked the organiser for the PowerPoint "equipment". He apologised, saying that he had forgotten but we should check with reception.

I went to reception and an employee offered to show me "PowerPoint". We returned to the room set aside for the event and the employee took great pride as he pointed out numerous **power points all along the walls!** What did I say and do next? Answers on receipt of an SAE!

When Cardiff University chemistry graduates are “de-briefed” and quizzed about their course, their progress and their views on the quality of teaching, they unanimously plead for lecturers to refrain from using PowerPoint.

My first attempts at using PowerPoint for chemistry teaching were disappointing. I wanted to impress the pupils with every snazzy effect including outrageous sounds and whirling images. I lost sight of the teaching and went for showmanship in my lessons.

Lessons soon got boring and I became a little disconsolate needing to re-think my approach. The greatest successes were with the sixth form who saw through the preposterous and adapted to the underlying content of the lesson material. They would often re-visit the presentations during self-study periods or would ask to take material home on disc.

I therefore asked my younger pupils what was good and bad about the PowerPoints and they helped me redesign my work.

Pupils like PowerPoint if it is presented properly. (No snazzy effects). They, like university undergraduates do not want to see someone’s lecture/lesson notes projected onto a screen. (How many teachers do the same with OHTs?) They love to see clear graphics and pictures of high quality. They appreciate a sequential approach to some subject material but get irritated when they are forced to learn in a regimented fashion. They like to browse a PowerPoint and love the opportunity to use material at home or on the school’s network. They like games and self-testing aspects and interactivity during lessons. They appreciate incorporation of short video sequences and links to other programs or the Internet. They like the combination of PowerPoint with an interactive whiteboard.

I’ve opened Yahoo groups and put PowerPoints and other material on the sites for the pupils to download. I give work to pupils on floppy disc or on CD.

PowerPoint is not the complete answer to a teacher’s dream of a great lesson, but used properly, it is a very good tool. I like using PowerPoint and I enjoy preparing lesson material. Office XP presents many more possibilities, especially with animation. I’m looking forward to producing more and I’ve still a huge amount to learn.

**Pete Hollamby, St Cyres School
2002-2003 Fellow**

MOVING DESIGN AND TECHNOLOGY FORWARD ON THE ISLE OF WIGHT

Can the Isle of Wight claim to be one of the strongest areas in the country for technological innovation – rocket testing, radar development, composites and turbine blade manufacturing, boat building, microwave engineering, electronic manufacturing, turbine support all combined with miles of blue flag beaches and large swathes of areas of outstanding natural beauty. So what are we up to apart from sunbathing?

The last 12 months have seen Design and Technology becoming increasingly strong on the Island and exciting initiatives are being carried forward through the work of the curriculum steering group and the more recently established CAD CAM users group. The curriculum steering group consists of a middle school colleague (Norman Cooper - AST in D&T), myself and a varying number of colleagues from any of the 69 schools in our LEA.

2002/3 is the year of Design and Technology on the Island (I would argue that every year is the year of D&T but that is just my being biased). Two main events have run – last October Trevor Bayliss was invited by the steering group to give a keynote speech as part of a celebration of Design and Technology. Trevor was fantastic – outlining his drive to make inventing a curriculum area and reinforcing the determination needed to see ground-breaking designs through to completion. More details of Trevor’s talk and links to his sites are at:
<http://www.geocities.com/coweshighdt/Deptnews/trevorbaylisreport.htm>

Our second event – taking place at the end of June is the annual Science and Technology Day – a load of pupils (about 150), a load of challenges and a whole load of prizes. If we don’t have fun the day isn’t worth running. Sponsorship from AMS (BAE systems) and Britten Norman (Island based aircraft manufacturers of the Islander) and our LEAs will make the day succeed.

CAD CAM will be taking the 6 Island secondary schools by storm in the form of Denford Microrouters and Graphtec plotters/cutters. Funding from the LSC has allowed the purchase of two CNC machines for each school and larger manufacturing facilities at the IoW College. The essential training to make the initiative take off has started in the form of proDesktop training (based at the IoW College and run by myself)

and will continue into Minicam and Virtual Mill training by Denford.

Layered into this work is a commitment to develop links with Intech at Winchester. Intech have developed a large interactive learning centre. This is combined with large lecture facilities - for lectures that make ice cream and set off fire alarms (all in the name of reinforcing concepts), a sciences/D&T equipment library and a shop full of brilliant D&T stuff (leave your credit cards at home!). For me it is really the toy library I never had access to as a child – racks of CNC mills, F1 track etc, I have just picked up a 3D scanner for a month and I've a shopping list that finally I can fulfil on my meagre budget.

**Mike Cargill, Cowes High School
2001-2002 Fellow**

DEVELOPING D&T RESOURCES FOR PUPILS WITH COMPLEX LEARNING DIFFICULTIES

My fellowship project aim was two fold and related directly to every day working with students who have prominent SEN syndromes such as ADHD, Dyslexia, Dyspraxia and Autism.

1) To analyse the designing and making process for pupils with complex learning difficulties in Design and Technology and then to develop appropriate materials and equipment for use by pupils in both special and mainstream schools.

2) To study and build up knowledge of the practical difficulties that pupils of all ages with learning difficulties experience when designing and making in the subject.

Early research began in 2002. During this time I worked with two groups of Year 8 and 9 pupils with severe learning difficulties who attended Design and Technology lessons at Watergate School. Throughout this time I observed and recorded the problems the pupils encountered. To summarize – most pupils were unable to use materials and equipment to develop their projects without continual and consistent support from an adult.

This has led me to focus on the development of resources to enable children with complex learning difficulties to become more independent in their work. Ongoing Investigations included relating the specific learning difficulty to a particular task. Research continued at Watergate during September to December through a wider range Y3

- Y12. As a direct result of this research the design and development of practical projects evolved.

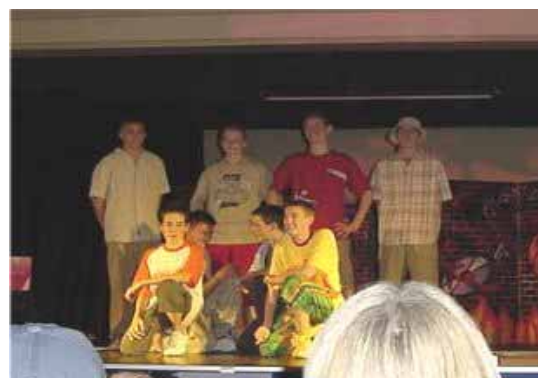
The focus has been to enable increased independent access for students with varying degrees of learning difficulties to work in Resistant Materials Technology.

Current research includes further development of jigs to support the construction of Automata and to incorporate Smart materials into this project. Alongside this practical project I am currently discussing with professionals such as Child Psychologists the possibility of identifying and relating precise problems with designing and making to specific learning disabilities.

**Carol-Anne Eades, Watergate School
2002-2003 Fellow**

FASHION CAFÉ

The Fashion Café project was finished last year. Since then I have produced a CD that explains to other schools how they could come up with a project that they could attempt themselves. The CD details what we have achieved in the project and where it fits on the AQA specifications. However, I'm not sure about distribution of the CD...so if anyone could help, I would appreciate it! (I can be contacted at julia.jj.jones@talk21.com)



The CD also includes information about what we have done this year, which includes 'The American Diner' activity. For this we had the same format for the project, but the food was hot dogs and tuile tubes for dessert. Resistant Materials made relish holders, Electronics designed, manufactured and ran a smoothie bar, Graphics designed and made themed menu cards, and Textiles produced waiter/ess clothing, key rings, juggling balls and photo frames. Performing Arts and

Dance students, who carried on the American theme in the show for people to watch, produced the entertainment for the Diner. All in all a very rewarding and enjoyable experience for all. I just hope other schools will have a go at something similar, to increase pupil enthusiasm and confidence in Design and Technology.

**Julia Jones, Sawtry Community College
2002-2003 Fellow**

COMPUTER BASED LEARNING MATERIAL

My project was to develop computer-based programmed learning material to aid transfer from GCSE Science to AS courses in chemistry.

I wrote in the last newsletter that my work was progressing well and that with luck my project would be completed on time. Well I'm happy to report that luck stayed with me and my work is complete and ready for submission and distribution.

I would encourage any current fellows to trial material in other schools, or at least to get colleagues to use their materials. It takes a lot of effort as other people are not as committed to your project but the comments and suggestions that arise are valuable. If the material receives universal praise the boost to your ego is tremendous (I imagine!).

I would like to thank Gatsby for providing the encouragement and structure for me to carry out my project and the opportunity to meet so many dedicated teachers. I would also like to thank other teachers and their students that helped in the production of the materials in particular Joe Campbell and Julia Brailsford, of Bilborough College, for their encouragement. Those fellows who attended the meeting at Warwick in June and heard my presentation had the opportunity to take away an advanced copy of my efforts. I would appreciate any comments that you might have about the materials. Pass them on directly to me via email
edwards114@ntlworld.com or
edwjac@rawlinscollege.org.uk

**Jack Edwards,
Rawlins School and Community College
2002-2003 Fellow**

INDIVIDUAL V GROUP PRACTICAL WORK IN SCIENCE

If you are teaching Year 7 in a middle school or meet Year 8 pupils for the first time in high school you may have experienced similar concerns to the ones that triggered my Gatsby Project. In many primary schools and in some less fortunate secondary schools, practically-based science is only possible in groups, which are often large. We have been finding that more and more pupils seem to sit back and allow one member of the group to do all of the practical work (the 'passenger syndrome'). Further, many pupils seem less confident and practical work was taking longer and longer. Children arrive at my secondary school with few practical skills in Physics and little hands on experience because of the excessive cost of most science equipment and/or lack of a laboratory or specialist science room. Science in Year 7 takes a somewhat back seat after KS2 SATs and in discussion with middle school colleagues they reported that pupils were harder to motivate and expressions like 'exam overload' or 'reached saturation point' were frequently used.

From September 2002 we changed from more than 10 to 3 main feeder schools, which means we can now more easily assist them in their Year 7 science teaching. Physics topics were the ones our primary colleagues said they lacked confidence in most and from September 2003 a forces topic is to move into Year 7. Developing inexpensive material to enable more pupils to work practically, to make an abstract concept like forces fun and boost the confidence of non-specialist science teacher seemed like a very useful project. The opportunity to explore the effect of pupils working individually in practical sessions was only possible if I could provide equipment. My project fell into 2 parts – the development of a class-made newtonmeter to allow individual work and a questionnaire to assess pupils' ideas on forces and to survey how they preferred to work in practical lessons.

The material used needs to be inexpensive and readily available and the instrument has to be easily made in a classroom, but challenging enough for all pupils. Discussions with D&T colleagues raised some useful ways of achieving my original design but it became increasingly obvious this was too complicated for the classroom (perhaps material for a future joint topic!). Back to basics I went, with the final model using garden wire, expendable springs, card, graph paper and sellotape. This

final version has now been successfully tested by 15 Year 7 and 8 classes (over 400 pupils) and all pupils and surprisingly all teachers enjoyed the activity which was presented as a task to make an accurate meter to measure the weight of a mystery box. The contents of the box are the prize for the winners.

The pre-task questionnaire was designed to enable me to look for differences between girls and boys, to see what ideas pupils had gained from KS2 and to compare Year 7 and 8 as well as look at pupil preferences. Some interesting and suggestive findings to date are that 93% of the pupils still liked to make things but 72% liked science activities.

So, creating the opportunity to occasionally make things in science ought to be a motivating tool worth further exploration. Working in science on your own (12%) was not as popular as making things on your own (20%) and there was no difference between boys and girls in their preference (58%) for working in pairs. However, to quote from a middle school colleague "it was peculiar to see that many of the children, who had stated they preferred to work in a group, chose to work independently making the newtonmeter". She also observed that the children who can often be 'off task' were totally engrossed in the project and the task they were given.

The Forces topic teacher guide and the newtonmeter project instructions and details will be available for anyone to use on a CD-ROM or printed copy or from the Gatsby website or via e-mail from me direct at alisonh@ukonline.co.uk. If anyone else is interested in carrying out a similar survey they are also welcome to the questionnaire along with the experience I gained in choosing the right kind of questions. The full findings will also be available in my final report.

Being a Gatsby Fellow has had unexpected, but very welcome dividends for me. It has made possible, contact with and support for all three main feeder schools in science. It has allowed my school to provide the equipment to further develop and resource a Year 7 topic, with the strong possibility of sending it to other schools in adjacent areas and playing a part in a new county resources centre. It has also personally allowed me to participate in another Gatsby funded project, the CPD course at York for Science teachers. It has left me with many more questions and ideas than I started with and this has refreshed and stimulated my role in the classroom. My thanks and appreciation to all the Gatsby Fellows I have met and to

everyone at GTEP - it has been a very special year!

**Alison Hamilton, Hellesdon High School
2002-2003 Fellow**

DEVELOPING MACROMEDIA FLASH™ MOVIES FOR SCIENCE TEACHERS WHY DEVELOP FLASH MOVIES?

I first came across Macromedia Flash on a training course for the use of interactive whiteboards. It seemed like the answer to some of the problems that I had as a science teacher. Many of the concepts that I taught to students were dynamic processes that were difficult to explain using static images and text. Using *Macromedia Flash* enables teachers to animate both text and graphics and so offers the opportunity for them to bring to life their presentations. Better still, one of the key elements of *Flash* is interactivity. This allows students not only to view a flash movie but also to interact with it, making it possible for them to get fully involved in a lesson since their actions can affect what is happening on the whiteboard.

Getting Started – After obtaining Flash 5.0 I set about working through the lessons in the "Help" section as well as some exercises in a book that I found to be a useful resource: 'Flash 5 Visual Jump Start' by Patricia Hartman. Tutorials from the web also provided ample material for me to sample many of the features of *Flash*. I then decided to try to use some of these features to create my own animation. Here I had a lot of difficulty. The same set of steps did not always produce the same results. I began to doubt that I would be able to master *Flash* in sufficient depth to produce any meaningful movies.

The main problem I had was isolation from any technical support. There was no one to turn to when things were not going well. Then I discovered that an ICT teacher and two sixth form students at my school had an interest in web design and were familiar with *Flash*. We set up a "Flash Club" that met every Wednesday lunchtime. Here we could swap ideas and also talk through any problems we were experiencing with a particular movie. This really helped me to become more proficient at using *Flash*; I could talk through problems that I was experiencing with the program and we could all learn different aspects of *Flash* from each other.

The Project – I started by producing a few trial movies where I experimented with layers, buttons and animation (all key components of *Flash*). My first proper movie that was intended for students was “Enzyme Action”. This featured a cartoon narrator who explained various features of enzyme action. The person using the movie could choose which aspect of enzyme activity they wanted to learn about by clicking on a series of buttons to one side of the narrator. The movie was completed by the end of January 2003.

I then set about evaluating this movie by showing it to several science teachers from my own school and other local schools. The feedback was encouraging, but many commented that it was more useful to individual students as a revision tool rather than a teaching aid that could be used as part of a normal science lesson. I decided that my next movie should be suitable for use by a teacher using a digital projector to a whole class. As I was teaching “the nervous system” to my sixth form at the time, I decided to use *Flash* to illustrate the sequence of events at a synapse.

The synapse movie took quite a while to complete as it was composed of over 30 layers each containing animation. When it was complete I showed it to my sixth form students during a nervous system revision lesson. Again the feedback from both students and teachers was positive. The main component that was missing was interactivity. I decided that my next set of movies would be “drag and drop” movies that would be suitable for teachers to use as lesson starters or as revision exercises on interactive whiteboards.

Taking it further – Learning how to make interactive movies proved to be the hardest and most time consuming part of the project as I needed to learn *Action Script*. *Action Script* is the language that *Flash* uses in order to make movies interactive. Again, tutorials on the web were invaluable. I even emailed an *Action Script* expert in Australia to help me to produce my first drag and drop movie, “The Eye”. This is basically a labelling exercise, where students can drag labels to the appropriate part of a diagram of the eye. If the correct label is chosen the program responds with a “Tara” sound and a tick appears next to the word. I have since moved on to produce similar drag and drop movies to aid the teaching of the human digestive system and mitotic division.

Conclusions – *Flash* is a very powerful program that has massive potential for teachers. It really can bring a lesson to life and is the best way to explain dynamic concepts to students. The

main limitation is the time needed by teachers to learn *Flash* and become a confident user. However, this is a one-off time investment. From my own experience I found that once I was able to produce one simple animation I wanted to spend more time learning the more refined features of *Flash*. I also found myself thinking about what other aspects of various specifications I would be able to animate.

For most teachers the time required to become proficient at using *Flash* is simply not available. A few, like me, will produce their own movies in order to deliver the curriculum. If these movies are published on the web, all teachers can share in this wonderful resource. I am grateful to the Gatsby Teacher Fellowship for providing me with the opportunity to develop *Flash* movies. I’ve thoroughly enjoyed my fellowship year and the opportunity to discuss innovative teaching approaches with colleagues.

**Arthur Harwood, Bishop Stopford School
2002-2003 Fellow**

DESIGNING AN INTERNET REVISION GAME FOR SCIENCE

My project is based on the fact that my four-year old son has learnt to read, write, count, order, use phonemes etc using some of the absolutely excellent computer learning games on the market. These games seem to exist up to the end of primary school age, but then die out completely. Instead they are replaced by revision exercises that are generally only interactive as basic question/answer exercises. I have, in fact, spent quite a lot of time over the last year writing these for our school’s website as part of our Beacon school activities. I thought it would be quite nice therefore to design a game for older students so that they could actually have fun whilst learning/revising.

To be of any value the game will have to be actually used and valued by the students. This requires it to be user-friendly, stimulating, fun and relevant to their learning. The hurdle to this, of course, is going to be the sophistication of the non-educational games to which they are used to on their play-stations and PCs. I can’t compete with the professional companies in terms of graphics and animations so I’m hoping to make up ground by developing good quality problems for them to solve.

An additional requirement is that the basic framework of the game needs to be adaptable/expandable in order to incorporate new

modules and/or changes to existing ones; for instance: the incorporation of *Bell Topic* material introduced into syllabi this year.

Basic Game Plan – This section is already changing rapidly in my mind, but basically the game will be developed around a number of discrete districts within a city and its outlying areas, each of which contains a number of puzzles to solve. Completion of all the puzzles within one district allows access to a new one by collecting keys to a gate. Although basically hierarchical, it may be possible that some districts occupy the same level allowing free movement between them. It will hopefully also be possible to introduce some form of password or level selection so that players do not have to repeat levels when returning to the game.

Every district will have access to the city's library in which the player can research answers to puzzles. This research element is one of the key ideas of the whole thing so that any student should be able to solve any of the problems if they dig deep enough into the library.

Software - I intend to build the game using *Quandary*, a maze engine produced by *Half-baked Software* (who also produce the *Hot Potatoes* suite with which I am already familiar). *Quandary* allows the easy creation of interlinked web pages and is remarkably adaptable in terms of the ability to insert graphics, animation, video and sound within the pages. It also contains simple but effective transaction and exclusion filters (keys). All I need to do now is learn how to use it!

**Chris Allen, Bingley Grammar School
2003-2004 Fellow**

GRAPHICS CALCULATORS AT KS3

My Gatsby year is almost at an end and it is time to look back and reflect on the success and fun my students and I have had. I chose my project to be 'Graphics Calculators at KS3'. As I am in a borough where the middle school/high school situation still exists we have our students starting at year 9. This means we have two terms only to prepare the students for their SATs exams. This is quite worrying as time is short. By concentrating on students at KS3 I felt that I could strengthen links with our feeder middle schools and more importantly move students on mathematically having a direct impact on our KS3 results.

I had three target groups. Firstly there were the students from middle schools whose ages ranged from yr 5 to yr 8, the bright and gifted mathematicians. These attended sessions at Cowes High School. The second group were from my school, yr 9. These students were the level 4/5 borderline students. They attended sessions to help them with exam preparation for their SATs in May. The third group was the staff. One of my aims was to increase the use of these calculators by staff in my school and our feeder middle schools.

I feel I have achieved these aims. There has been a marked increase in provision in the use of graphics calculators at Cowes High School. This has also been reflected in the science department who has used them mainly for data logging. My extra curriculum sessions with students were delivered with the graphics calculator being the main ingredient. The sessions taken have been challenging and have encouraged the students to become more confident in the use of this hand held piece of technology. It has also allowed them access to branches of the curriculum which otherwise would have been totally inaccessible. I have been into various middle schools, taken lessons and given INSET to staff there. They are now taking lessons for themselves using our equipment. The feedback I have had from parents and staff has been very positive. Students have enjoyed the extra sessions. I now need to analyse the yr 8 SATs results to see the impact of this extra support.

My Gatsby year was 2002 to 2003. However the good practice and seeds sown in this academic year will develop and grow in future years. The lessons I have written, the training received and the benefit to students will continue into the future. Thank you Gatsby for making that difference to our students and staff.

**Patricia Warner, Cowes High School
2002-2003 Fellow**

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