



Science 2001: new syllabuses – fresh challenges

The New HSC Science syllabuses represent a fresh and new approach to science education. They are based on research into what constitutes important science outcomes for students and they encourage learning of science ‘in context’. Unlike previous Science syllabuses, these new syllabuses include prescribed focus areas and mandated skills groups that reflect key competencies. Teachers implementing these syllabuses are already noticing the strengths and benefits of this approach.

Kerry Sheehan, Head of Science at La Salle Catholic College at Bankstown is teaching the new Biology course. Kerry believes that the new Science syllabuses better recognise what students value and are interested in. He compared the new and old syllabuses in these terms:

- ◆ *The older syllabuses mainly allowed teachers to be content and knowledge experts. They were information-based and lent themselves to a learning environment based on a teacher-centred approach to science education. These new syllabuses place an emphasis on what students can do, so they actively encourage the teacher to move from the front platform in their laboratories and create active dynamic learning environments.*

Exemplary teaching and learning practices have always been part of science education in NSW and the new HSC syllabuses more strongly incorporate these practices. David Tweed, Stage 6 Coordinator at Penrith Anglican College summarised the changes in his comments about the Physics syllabus and the programming that is required:

- ◆ *It's very different. The new syllabuses are much more prescriptive and they tell you what to teach and when. You have to grab the skills from the syllabus and incorporate them in your teaching. There's more direction and some teachers appreciate this. I like what has happened in the*

Physics syllabus – it's more positive and there's an individual context for each unit. There is a better flow of concepts and I am finding that students pick it up much better. For example, in 'The World Communicates' context you can bring in all the things that students find more relevant and interesting such as waves, sound and technology.

The new Science syllabuses have not only adopted a student-centred approach to science education. They also embrace up-to-date science. Don Brian teaches Science at East Hills Girls Technology High School. He has taught Earth and Environmental Science with Year 11 and Year 12 students. Don applauds the fresh new approach but agrees that delivering the benefits to students is not without its challenges:

- ◆ *Getting relevant material can be challenging, especially where the syllabus specifies particular examples. Another challenge occurs when the language level of some resource material, for example journal articles and Internet resources, is beyond the literacy level of some of my less able students.*

David Tweed also noted the impact on the teacher of the newer resource materials and teaching practices required by the new syllabuses:

- ◆ *You have to make sure you have access to the Internet and library resources. You need to be very well organised on the 'teacher side of things' so that the students can find the information and extract the benefits.*

For Don, this was not a problem:

- ◆ *I don't have a problem because for me there is no real change in teaching approach or the range of strategies I use. I guess the main concern with new material is that you don't have the bank of the usual 'bed-time stories' to tell – the new emphasis requires the collection of new stories!*

HSC and SC Important Dates

Year 10

- 27 Jul** Dispatch principals' 'N' determination forms.
Board Endorsement panel final decisions.
- 10 Aug** Board Endorsed Course applications not endorsed by this date lapse.
- 14 Sep** Final date for amendments to students' entries.

Year 11

- 27 Jul** Dispatch principals' 'N' determination forms.
Board Endorsement Panel final decisions.
- 10 Aug** Board Endorsed Course applications not endorsed by this date lapse.
- 14 Sep** Final date for amendments to students' entries.
- 17 Oct** Latest date for date for principals to notify students of intention to award an 'N'.
- 19 Oct** Final date for submission of VET course competencies via Schools Online.
- 22 Oct** Latest date for student appeals against 'N' determinations to be lodged with the principal.

Year 12

- 23 Jul** Dispatch Illness/Misadventure forms.
- 27 Jul** Dispatch principals' 'N' determination forms.
- 1 Aug** Advice to candidates of venues and times for HSC Speaking exams in Languages progressively from this date.
- 5 Aug** Completion date for Society and Culture PIP (submission details to be advised).
- 10 Aug** Board Endorsed Course applications not endorsed by this date lapse.
- 13 Aug** HSC Dance Practical exams commence.
Schools Online assessment collection service opens.
- 17 Aug** Latest date for principals to notify students of intention to award an 'N' determination.
- 18 Aug** HSC Languages Speaking exams commence.
- 19 Aug** Completion date for Drama Individual Projects, and Textiles and Design Projects.
- 20 Aug** HSC Drama Practical exams commence.
- 21 Aug** Latest date for student appeals against 'N' determinations to be lodged with the principal.
- 26 Aug** Completion date for Industrial Technology Major Projects.
- 27 Aug** Latest date for principals to notify students of outcome of school review of 'N' determinations.

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CHECK YOUR MAILBOX



- ❖ MYDA Poster
- ❖ MYDA Flyer
- ❖ Aboriginal Visual Artists Flyer
- ❖ English 7-10 Draft Writing Brief and Survey
- ❖ History Course Performance Descriptors
- ❖ Geography Course Performance Descriptors
- ❖ SC 2000 Sample Answers pamphlet
- ❖ K-10 Curriculum Framework (Version 2) and Survey
- ❖ English K-6 Work Samples CD-Rom

The *Board Bulletin* is a regular publication by the Board of Studies NSW. Principals are requested to circulate it among teachers and members of the School Council, P & C and parents. One copy should be filed for reference. Schools may only photocopy this publication for use by teachers, students and parents. Contributions or suggestions for articles are welcome.

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President's Message



Recently the members of the Board of Studies met with members of the Board of Vocational Education and Training to discuss issues around VET in schools. Both Boards have been delighted to see the take up of VET framework courses in the HSC. The New HSC has brought vocational and general education closer together, with all courses requiring greater attention to student outcomes or competencies.

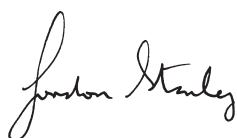
Our common objective is to encourage all students to strive towards excellence in all fields of study. The new standards-referenced reporting model for the HSC incorporates the best features of general education and VET assessment approaches in a common framework which incorporates both curriculum and performance standards. It is pleasing to note that over 40% of the candidature in VET framework courses are taking the external exam so that the different levels of achievement can be acknowledged and the result can contribute towards a UAI. NSW leads the nation in participation in meaningful VET courses as part of the senior secondary certificate.

In my discussions with teachers and principals as I move around the State I have found some apprehension about how the HSC results will be interpreted in the new standards-referenced format. We are developing a communication package to assist schools to interpret the changes and assist their school community to understand the meaning of the results.

We want to shift the interpretation of results away from numbers towards statements about the meaning of the achievement. To say that a student is performing at band six has no meaning in itself unless the statement is accompanied by the subject-specific performance description. In turn over time the performance description (performance band) will be enriched by examples of student work at that level. Bands are categories intended to give meaning to marks, not numbers that have any independent meaning.

Responses to the first discussion paper on the Board's planned K-10 Curriculum Framework have been very helpful in shaping the next consultation paper which has developed nine propositions for further consideration. One issue that has come up in many discussions with schools has been the recognition of the extent of existing flexibility in the Board's requirements, which have often not been realised because of custom and practice.

As the terms of some Board members expire in June the Board will be welcoming new members at the August meeting. The Board has been fortunate in the commitment of members during the busy reform agenda of the past three years and in the next Bulletin we will be acknowledging those who are leaving as well as introducing the new members.



(Professor) Gordon Stanley

Board Bulletin in brief

Science Article

Four Science Teachers share their experiences in teaching the new Stage 6 Science Syllabuses.

New HSC Fact Sheets

A package of fact sheets regarding the New HSC is currently being prepared.

Preparing students for the New HSC examinations

A handy guide for teachers about the range of support materials that the Board of Studies has provided to assist them in preparing students for the New HSC.

Computing Skills Assessment for Year 10

Feedback from the consultation with teachers regarding the best way to implement the Year 10 Computing Skills Assessment has shown broad support for increased emphasis on information and technology in the curriculum.

New VET frameworks

Brief update regarding the Board's review of feasibility studies for possible expansion of VET in the New HSC.

Mathematics K-10 syllabus review and development

A project team of primary and secondary educators has been developing Mathematics K-10 draft writing briefs.

Board of Studies publications shortlisted for an award

The following Board of Studies publications have been shortlisted for The Australian Awards for Excellence in Educational Publishing:

Move Ahead with Street Sense

Visit Gallipoli (www.anzacsite.gov.au)

Teaching Heritage

(www.teachingheritage.nsw.edu.au)

Preparing students for the New HSC examinations

The Board has provided extensive support for teachers to assist them in preparing students for the New HSC examinations. Schools can use this article to check that they have fully accessed the support materials available.

Standards-referenced assessment

The New HSC examinations will be standards-referenced. For a quick summary of the difference between the old norm-referenced HSC and the new standards-referenced approach read page 6 of the Board's New HSC Assessment Support Document sent to schools in 1999.

New HSC examination setting principles

To ensure that the questions in the New HSC examinations follow a standards-referenced approach, the Board developed a set of principles for its examination committees to follow as they developed the examination papers. All examinations in 2001 will follow these principles. The principles can be accessed in Board Bulletin Vol 8 No 9 sent to schools in December 1999.

HSC specimen examination papers

The HSC specimen examination papers are part of a package that contains useful and important information for teachers preparing Year 12 students for the HSC examinations in 2001. The package is available in schools and is also on the Board's website. The specimen examination paper is a good guide as to what to expect in the first New HSC examination; however, the examination in 2001 cannot be a carbon copy of the specimen paper. The introduction to each specimen paper highlights important points about the specimen paper, such as where question types are different from those that have appeared in the past. In addition, it may indicate ways in which HSC examinations may vary from year to year.

Specimen examination mapping grids

Each specimen examination paper package includes a mapping grid. The grid shows, for each question in the specimen examination, the syllabus content and outcomes it relates to and the bands on the performance scale the question is targeting. Reading the grid in conjunction with the syllabus

and the band descriptions in the performance scale gives a good indication of the scope and depth of questions. The performance scale is in the specimen paper package.

It is important to remember that the mapping grids apply only to the specimen examination papers. The HSC examination in 2001 may sample a slightly different but equally representative set of outcomes from the syllabus.

Sample marking guidelines

Marking guidelines for a sample of questions in each specimen examination paper are also available as part of the specimen paper package. The marking guidelines have been prepared using the Board's principles for developing marking guidelines in a standards-referenced approach. The principles can be read in the article *Principles for Developing Marking Guidelines for Examinations in a Standards-Referenced Framework*, published in Board Bulletin Vol 9 No 3 (May 2000).


These guidelines indicate the approach that would be taken to marking questions. For each question, the guidelines show the syllabus outcomes that are targeted by the question and the assessment rubric, where there is one from the specimen paper, listing the set of general criteria that are used to assess student responses.

The marking guidelines show the criteria to be applied to responses along with the marks to be awarded in line with the quality of the responses. The criteria are not exhaustive, but rather an indication of the considerations that students should include in their responses.

Board of Studies website

All of the documents referred to in this article are available on the Board of Studies website (www.boardofstudies.nsw.edu.au).

Further information

The materials listed above will assist teachers as they prepare their Year 12 students for the 2001 HSC examinations. For further information please contact the Board of Studies Liaison Officer in your area or the Office of the Board of Studies, Assessment Branch on (02) 9367 8300. 

Computing Skills Assessment for Year 10

Earlier this year the Government announced plans for the introduction of statewide Computing Skills Assessments for all Year 6 and Year 10 students. These statewide assessments are intended to measure students' knowledge, skills and understanding in the use of information and communications technology (ICT).

The Board of Studies is responsible for the Year 10 Computing Skills Assessment, while the Year 6 Assessment is to be developed by the Department of Education and Training. Over the recent months, the Board has been consulting with teachers, principals, school systems and professional associations to seek advice on the best way to implement Computing Skills Assessment for Year 10. Students will be required to demonstrate designated computing competencies throughout Year 10 and also complete a statewide test.

Feedback from the consultation process has shown broad support for the increased emphasis on information and communications technology in the NSW curriculum. It also acknowledged that the implementation of a completely online test in computing skills delivered to all Year 10 students is still some way down the track. Support was given to the Board's proposal for the test to be initially based on pen and paper, with an online test to be developed concurrently.


The consultation recommended that the school-based assessment of computing skills be manageable, sufficiently flexible to allow for the wide variety of school needs and resources, and able to be

integrated into schools' current teaching, learning and assessment programs.

During 2001, a small-scale trial of the Computing Skills Assessment for Year 10 students involving approximately 20 schools from both city and country areas will take place. The trialling will include both test items and school-based assessment of computing competencies, as well as exploring a variety of reporting models and online delivery. A larger trial of about 100 schools is planned for 2002, and this will include any modifications as a result of this year's trialling and consultation.

Full implementation of the Computing Skills Assessment for Year 10 will take place in 2003, using the model refined through the trialling period. Over the following years, the Computing Skills Assessment will be strengthened by the inclusion of more focussed ICT content in revised Years 7 – 10 syllabuses, and by the wider use of online delivery of the computing skills test.

It is the Board's intention to develop a computing skills credential that is relevant and highly valued by employers as well as providing students with opportunities for credit transfer for further study and other qualifications.


Further updates and information about the Computing Skills Assessment for Year 10 will be provided in future Board Bulletin articles. The Board's website: www.boardofstudies.nsw.edu.au has an area within the School Certificate page where information about the Computing Skills Assessment may be accessed. 

Mathematics K-10 syllabus review and development

The Board of Studies recently considered a report on the review of Mathematics K-10 syllabuses. In addition to identifying the overall key findings from the review, the report set out broad directions for the development of syllabus writing briefs in Mathematics for the compulsory years of schooling. A copy of these broad directions, which were endorsed by the Board, along with the review report, is available in the 'What's New' section on the Board of Studies website (www.boardofstudies.nsw.edu.au).

A project team of primary and secondary educators

has been developing Mathematics K-10 draft writing briefs. The final writing briefs will set the direction for the development of draft Mathematics K-10 syllabuses.

Schools should note that consultation on the writing briefs will take place between July 23 (the first day of Term 3 for most NSW schools) and August 27, 2001. The consultation process will include a survey that schools and individuals can access and return via the Board of Studies website. Focus group meetings in both rural and metropolitan NSW will also be held. 

Science 2001: new syllabuses - fresh challenges *continued from p 1*

Science teachers are thus faced with dual challenges in changing science classroom culture and coming to grips with new knowledge. Some of the contemporary content and many of the more up-to-date science examples are more effectively engaged by students through a broader range of information sources, the Internet and science journals included. Fiona Branch, an experienced Geology teacher at Pymble Ladies College, currently teaches Earth and Environmental Science. According to Fiona:

◆ *The first consideration for me in teaching this new syllabus was the breadth of knowledge needed. I am doing a lot of learning myself and I am enjoying this learning. I am calling on industry sources that I may not have used before. I contacted the agricultural industry, for example, to present my students with the up-to-date information about the use of pesticides.*

Don had no doubts about the need for careful planning:

◆ *It takes a lot of work to teach any new syllabus and it is most important to be forward looking, well organised and plan ahead. It is only with this planning that you can avoid the pitfalls of spending too long on areas which can use up a lot of time. The particular challenges for me lay in trying to find the right depth of treatment for some of the seemingly simple investigations, which are aligned to theoretical aspects of the course requiring deeper treatment.*

As Kerry pointed out:

◆ *Teachers should not be attempting to do every new program for every syllabus on their own. They should use Board of Studies and other programs supplied on the web to help them out. These really provided me with a good start! I am using them to good effect. The increased practical load forces us to be pro-active and prepared. For example, at La Salle, we have coped by bringing children to the equipment, rather than move the equipment around, and this allows us to rationalise preparation time.*

An issue raised by some Science teachers is that the courses seem too crowded and that finding time to finish the courses is a problem. Fiona observed that:

◆ *I have found that the work required to implement the syllabus is quite demanding and part of the*

problem is that it is difficult to determine the required depth of knowledge to teach.

Don offered this view:

◆ *I am 'doing OK' in relation to the 'time' issue and will finish with time to spare. I know that some people have spent a long time by interpreting literally every dot point. By looking ahead, I have avoided some of these problems.*

David also added:

◆ *They thought Biology was a bit too deep with too much content. A lot depends on your teaching style. For example, some teachers struggle with the idea of 'context'. If your teaching style is more traditional, it makes the context a bit harder to integrate and it then appears more time consuming than it actually needs to be. You have to re-work what you have done in the past and make it more beneficial in terms of outcomes for the students.*

So is the hard work of Science teachers paying off in terms of enhanced student interest, engagement and learning in science? When asked about the impact of these syllabuses on students, the teacher responses were positive and forward looking:

◆ *Fiona – student response has been mostly positive. The girls are enjoying the work, and practising the skills they are building up. They are finding the course interesting, stimulating and challenging as it contains up-to-date information on current issues. They are enjoying their learning and practising their skills in effective research and teamwork.*

◆ *Kerry – the students are interested. The new syllabus content is quite up-to-date and is 'Australian-based'. Consequently, it is meaningful and 'in context' for the students. The change in approach has made Biology an immensely engaging learning experience for my students. The new syllabuses provide greater opportunities for the students to experience success and we are all reaping the rewards. They are growing in confidence and they are learning better. I am just thoroughly enjoying the new course!*

◆ *David – my students were finding the new syllabus very different to the science education they had previously experienced. The main difference is that they have to go out and get information rather than have it delivered to them. They found it difficult at first to get their own information but then it becomes a natural process. I think it is a positive move*

forward in terms of benefits and outcomes for the students. It is a much better way of learning! The new Year 10s will have a much better grasp of how to do this.

Don's experiences have been much the same:

- ◆ *Generally, students are responding quite well to the new syllabus. In my class there are girls with specific interests — cosmology, plate tectonics and environmental issues. The formal book learners are less at ease with the open-ended nature of the research and investigation activities – this is a skill that needs to be learned.*

All the teachers interviewed commented on the importance of collegial support and collaboration in successfully implementing the New HSC science syllabuses and ensuring that students reaped the benefits of the new content and approaches.


Kerry:

- ◆ *Don't try to do everything at once and don't try to re-invent the wheel. Use the resources provided*

wherever possible. They are there!


David:

- ◆ *I get help and support by participating in teacher-teams across the region and by getting together with other teachers. Networking is most important.*

The Board is assisting school systems in the development of Quality Teacher Program material, which will provide further support for the implementation of the courses over the next 18 months. The Science Teachers' Association of New South Wales continues to provide practical assistance with the implementation process. They are holding state conferences at five venues to increase opportunities for science teachers to experience this vital collegial support. Conferences will be held in Tamworth, Coffs Harbour, Canowindra, Narrandera and Terrigal during Term 2, 2001. Watch the Science Teachers' Association web site for further details: <http://www.stansw.asn.au> 


New HSC Fact Sheets

The Board of Studies is currently developing a range of fact sheets to support the New HSC. Areas being covered include:

- Key features of the New 'standards-based' HSC
- Setting the New 'standards-based' HSC examination papers
- Marking the New 'standards-based' HSC examination papers
- Aligning the New 'standards-based' HSC marks to the standards
- School-based assessment
- Benefits of the new Industry Curriculum Framework courses
- The New 'standards-based' HSC portfolio of credentials — what do students get?
- HSC Course Reports — an explanation of results
- Order of merit for the New 'standards-based' HSC
- Extension courses
- The Universities Admission Index (UAI). 

New VET frameworks

The Board has reviewed feasibility studies for the possible expansion of VET in the HSC. The areas studied were Automotive, Child Studies, Health, Entertainment and Sport and Recreation. It was recommended to the Board that work commence immediately on a combined Entertainment and Music Industry Curriculum Framework.

The Board will seek further advice on some issues while concurrently proceeding with the development process. Supplementary investigation will be carried out in the Health and Child Care areas with framework courses possibly available for delivery from 2003. Further investigation will also be carried out into the areas of Automotive and Sport and Recreation before any framework course will be considered. 

What's New on the BOS website this month?

This Board Bulletin (and all previous ones) as well as the Official Notices are available online at http://www.boardofstudies.nsw.edu.au/docs_bulletins/bbull1.html

You will also find a cumulative list of all Official Notices for 1999-2001.

The 2001 School Certificate Science Test Specimen Paper and the updated Course Performance Descriptors, Issues Statement, Mapping Grid, Performance Bands and Test Scope Statement have been added to the School Certificate Page. These can be found by clicking the School Certificate button on the main page of the website, or by going directly to:

http://www.boardofstudies.nsw.edu.au/docs_sc1998/sc_review.html

Secondary principals and head teachers of Science may wish to re-read the memorandum that was fax-streamed to schools about the Preliminary Science Courses Amendments - effective 2001. This can be found by clicking the 'What's New' button on the main page of the website, or by going directly to http://www.boardofstudies.nsw.edu.au/aa_main/new.html

The document *Assessment and Curriculum Information for the Mathematics, Mathematics Extension 1 and Mathematics Extension 2 courses* can be found by clicking the 'What's New' button on the main page of the website, or by going directly to:

http://www.boardofstudies.nsw.edu.au/syllabus99/syllabus2000_listm.html This document is adapted from the Stage 6 Mathematics KLA Handbook (1996), pages 17-35, and contains the Preliminary/HSC course divisions (where applicable), School Assessment Guide and HSC Examination Specifications for the Mathematics, Mathematics Extension 1 and Mathematics Extension 2 courses.

On 19 April 2001, English Stages 4-5 Documents were added to the English Page at:

http://www.boardofstudies.nsw.edu.au/docs_english/english_page.html

Read the English Stages 4-5 Symposium Proceedings Part 1, the Review Consultation Summary Findings and the Broad Directions for the English Stages 4-5 Writing Brief.

On the Aboriginal Education Research Resources pages, you will find a new addition, *Research into the Numeracy Development of Aboriginal Students: Implications for the NSW K-10 Mathematics Syllabus*, a report by Tracey Frigo and Lee Simpson.

http://www.boardofstudies.nsw.edu.au/aboriginal_research/aboriginal_research.html

The Middle Years Literature Review, a report by Associate Professor Roslyn Arnold (University of Sydney, Faculty of Education) can be found by clicking the Reading Room button on the main page of the website, or by going directly to:

<http://www.boardofstudies.nsw.edu.au/docs/docs.html>

A file containing all the new course numbers for all Board Developed Courses for the year 2001 can be downloaded as an MS Excel Spreadsheet from the HSC and SC Statistics pages. This can be found by clicking the HSC & SC Statistics Archive button on the main page of the website, or by going directly to:

http://www.boardofstudies.nsw.edu.au/docs_stats/hscstats_page1.html