

Upper Secondary Education Reform



UPPER SECONDARY CURRICULUM IMPLEMENTATION HANDBOOK



Papua New Guinea
Department of Education

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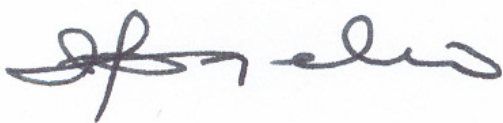
Secretary's Message

The work of principals is crucial to the success of the education reforms. The reforms affecting high schools and secondary schools so far have been mainly structural. We must now support these structural reforms with reforms to our curriculum.

The Curriculum Development Branch of the Curriculum Development and Assessment Division has reformed the curriculum for upper secondary to complement the reforms to basic education from Elementary Prep to Grade 8, and further on to secondary level. These officers have worked with teachers from all regions to ensure that the new curriculum is relevant to our country's needs. Work has been completed on twenty five new upper secondary syllabuses and twenty four teacher guides. In-service materials are being developed and will be distributed to assist teachers to understand and implement the reform syllabuses.

This handbook will help principals and head teachers and their colleagues support the introduction and implementation of the new curriculum for upper secondary education. The new curriculum materials will only assist our students and our country when you and your teachers breathe life into them. The publishing of these documents alone will not change the curriculum in our schools. You and your teachers need to understand and implement the new curriculum. This will require you and your teachers to adapt and improve current practices. I am confident you and your teachers will accept this challenge in the same way that you and they have supported the structural reforms that are dramatically changing the face of education in this country.

I urge you to read this handbook thoroughly and plan carefully with your teachers and community how you will introduce the new upper secondary curriculum by the beginning of 2010.

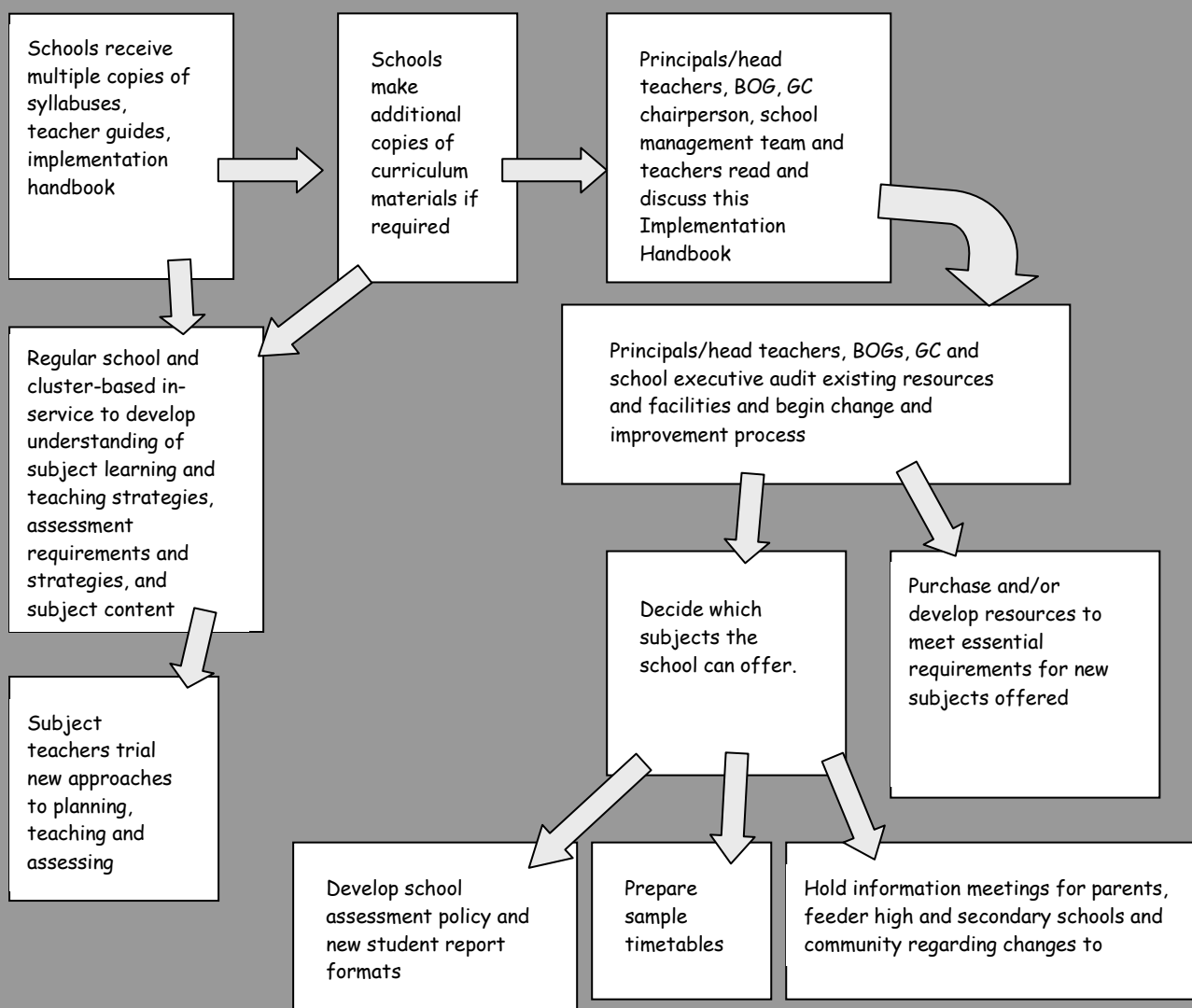


DR JOSEPH PAGELIO
Secretary for Education

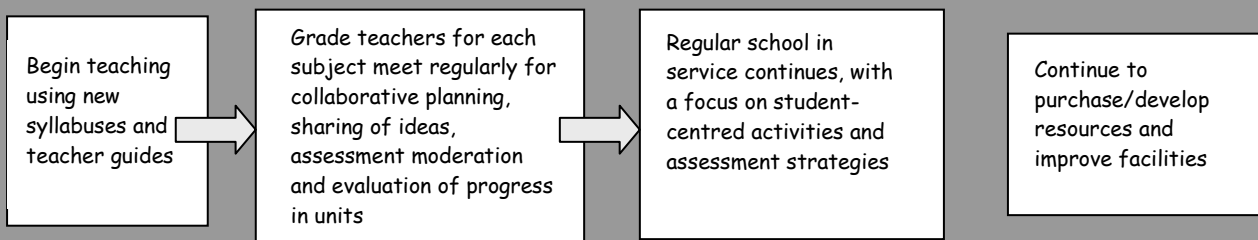
Implementation timeline and activities

2009

Some in-service activities on the outcomes approach and planning and programming at school, cluster and/or provincial level



2010



CONTENT

Secretary's Message	3
Implementation timeline and activities	4
Introduction	8
When will the upper secondary reform curriculum be implemented?	8
Assets and resource management	8
Who needs to be informed?	8
Section 1: Education reform	9
Learning areas and subjects	10
Section 2: Outcomes approach	12
Section 3: Background policies and plans	15
National Curriculum Statement 2002	15
National Assessment and Reporting Policy 2003	15
National Plan for Education 2005 to 2014	15
Gender Equity in Education Policy 2003	16
HIV/AIDS Policy for the National Education System of Papua New Guinea 2005	16
2007-2014 National Teacher In-service Plan – July 2006	17
Education Plan 1995-2004	18
Language policy - The Purpose and Future Direction for Language Use in School	18
Section 4: Implementation messages, roles and responsibilities	20
Principals/head teachers	20
Pre-service and practicing secondary teachers	20
Boards of Governors./Governing Councils	21
Provincial education authorities (PEA, LLG, DEA, PEB)	21
Parents, guardians and the community	22
Secondary students	23
Senior Standards Officers	22
Guidance officers and school counsellors	23
Section 5: Upper secondary curriculum framework	25
The subjects	25
Implementation timeframes	26
Syllabuses and teacher guides	26
Assessment, examinations and certification	28

Section 6: Managing curriculum change	30
The changes	30
Change management	30
The professional learning team	31
School based in-service	31
Section 7: Implementing the Curriculum	33
Essential requirements	33
ACCOUNTING requirements	32
APPLIED ENGLISH requirements	33
ADVANCED MATHEMATICS requirements	34
APPLIED NATURAL RESOURCE MANAGEMENT requirements	35
APPLIED SCIENCE requirements	39
BIOLOGY requirements	40
BUSINESS STUDIES requirements	41
CHEMISTRY requirements	43
DESIGN AND TECHNOLOGY requirements	44
ECONOMICS requirements	46
GENERAL MATHEMATICS requirements	47
GEOGRAPHY requirements	48
GEOLOGY requirements	49
HISTORY requirements	50
INFORMATION COMMUNICATION TECHNOLOGY requirements	51
COMPUTER STUDIES requirements	53
LANGUAGE AND LITERATURE requirements	54
LEGAL STUDIES requirements	55
MUSIC requirements	56
PERSONAL DEVELOPMENT requirements	57
PHYSICAL EDUCATION requirements	58
PHYSICS requirements	59
THEATRE ARTS requirements	60
TOURISM STUDIES requirements	61
VISUAL ARTS requirements	62
Staffing new and existing subjects	66
Choices and options	67
Meeting agency requirements	67
Catering for the needs of all students	67
Timetabling	67
Sequencing within subjects	68
Section 8: Curriculum Resources	69
Budgeting	69
Text books	70
School developed resources	70
Section 9: Planning and Programming	72
Collaborative planning	72
Team Teaching	72
Integration	73
Skills development and practical activities	73

Section 10: Guidance and Counselling	74
Guidance and counselling services	74
Pathways for students	75
HIV/AIDS	75
Aptitude Test	76
Support Services	76
Section 11: Glossary	77
Appendix 1: Frequently asked questions	79
Education Reform	79
Outcomes approach to education	80
Learning and teaching	82
Assessment	84
Parents/guardians	86
Teachers	86
Resources	87
Upper Secondary Curriculum	88
Appendix 2: Resources available in the provinces	91

Introduction

This handbook provides background information that will help you understand and prepare for the implementation of the new upper secondary curriculum. Teacher educators, education officers, senior standards officers and school administrators need to be well informed and able to pass on key information to others.

It is essential to read this handbook because it contains:

- information about the emphasis of curriculum reform
- key messages to give to teachers, students and those in the community
- important features of the new upper secondary syllabuses
- useful hints on how to implement the curriculum changes
- a glossary of terms used in curriculum documents.

When is the upper secondary reform curriculum to be implemented?

School planning for the implementation of the upper secondary curriculum must take place in 2009. This planning will take place along with the development of the wider whole school learning improvement plan (SLIP). Full implementation of the reform curriculum must take place from the beginning of 2010.

Assets and resource management

It is your responsibility to make sure that the new curriculum materials remain in the school and that they are maintained. These materials will be required to last at least five years. Replacement copies will only be provided at the school's expense.

The materials belong to the school, not the teachers. Label or stamp all the curriculum materials with the school stamp. If you do not possess a school stamp, write the school's name at the front of the books. If the curriculum materials are loaned to teachers make sure you keep a record of to whom they were given and the date they provided. Teachers should sign the book to acknowledge they have received the materials.

Who needs to be informed?

This handbook contains key messages for you and various stakeholder groups who need to be informed about the curriculum changes that will take place in secondary/national high schools. You must read the handbook carefully and familiarise yourself with its content. You must provide opportunities for teachers, BOG/GC members and others to also read and discuss the content.

Section 1: Education reform

Education reform has been undertaken to produce an education system that meets Papua New Guinea's needs, in today's challenging world and in the future. The reform began in 1994 and has as one of its key objectives: "To develop an education system to meet the needs of Papua New Guinea and its people, which will provide appropriately for the return of children to the village community, for formal employment, or for continuation to further education and training (National Education Plan, 1996, p 2)." This includes both the reform of the whole curriculum and the restructuring of the whole system.

The foundation of the reform is the promotion of culture, values, attitudes, knowledge and a range of skills appropriate for Papua New Guinean society along with the need for international competitiveness. Before the reform, the Papua New Guinean curriculum was based on foreign Western beliefs and ideas mainly to produce Papua New Guineans to administer the country and achieve academic success. It was recognized that this system needed to change in order to provide a useful education for all other citizens of Papua New Guinea.

The key features of the education reform are:

- a new and more relevant curriculum which emphasises skills development and the use and maintenance of the local languages of the community
- nine years of universal basic education
- the establishment of community-based elementary schools (Elementary Prep to E2) that use the community vernacular as the main language of instruction
- converting community schools into primary schools for grades 3-8
- gradual bridging to English as the language of instruction in the primary school, while maintaining use of the students' vernacular
- the addition of grades 11-12 in provincial high schools to create grades 9-12 secondary schools.
- increasing access to grades 9 and 10 and to grades 11 and 12.

The education reform redirects the school curriculum towards education for integral human development (IHD) rather than for meeting workforce needs only. The reform curriculum has to prepare adequately the majority of school leavers (up to 85%) to live in their communities and conduct community-based subsistence and small-scale commercial enterprises, while at the same time support the other 15% of students who will find paid formal employment or enter tertiary education upon leaving school.

Elementary reform curriculum materials began development in 1994. A full set of the elementary curriculum materials was distributed to all elementary teachers in 2001. The first edition of lower primary (grades 3-5) curriculum materials began development in 1995 and were distributed with some support materials in 2000. Upper primary reform syllabuses commenced development in 2000 and were trialled in Milne Bay and New Ireland provinces in 2001. They were distributed to schools during 2004. The first Grade 8 examination based entirely on the reform curriculum took place in 2008.

The lower secondary curriculum was reviewed early in 2004 and the development of new syllabuses commenced soon after. Implementation began with Grade 9 in 2008 and will be followed by the first new Grade 10 examination in 2009.

Review of the upper secondary curriculum commenced in 2007. New Syllabuses and Teachers Guides were developed soon after. Implementation will begin with grade eleven in 2010 followed by the first new grade 12 examination in 2011.

Over the last few years, structural reforms have outpaced the development and release of reform curriculum documents and the provision of related teacher in service. This has resulted in a situation where reform elementary, primary and secondary schools and classes have been formed, but many teachers have not been trained and some curriculum materials are not available. Teacher training needs will be addressed through the 2007-2014 National Teacher In service Plan. Consultations have been ongoing with University of Goroka to address teacher specialisation for new subjects being offered in Upper Secondary.

Learning areas and subjects

The National Curriculum for Papua New Guinea is organised into five learning areas: Culture and Community, Language, Mathematics, Personal Development and Science. A learning area is a group of subjects with compatible knowledge, skills, and attitudes. All subjects from Elementary to Upper Secondary are assigned to one of these learning areas. Some subjects draw upon knowledge, skills and attitudes from more than one learning area (e.g. Environmental Studies), but they have been placed in the learning area whose content is judged most similar.

Learning area	Elementary	Lower primary	Upper primary	Lower secondary	Upper secondary
Culture and Community	Culture and Community (includes aspects of the following: Arts Community Living Environment Health	Arts Community Living	Arts Social Science Making a Living	Arts Social Science Business Studies Agriculture	Music, Theatre Arts, Visual Arts Legal Studies Geography, History, Economics, Accounting Business Studies, Applied Natural Resource Management

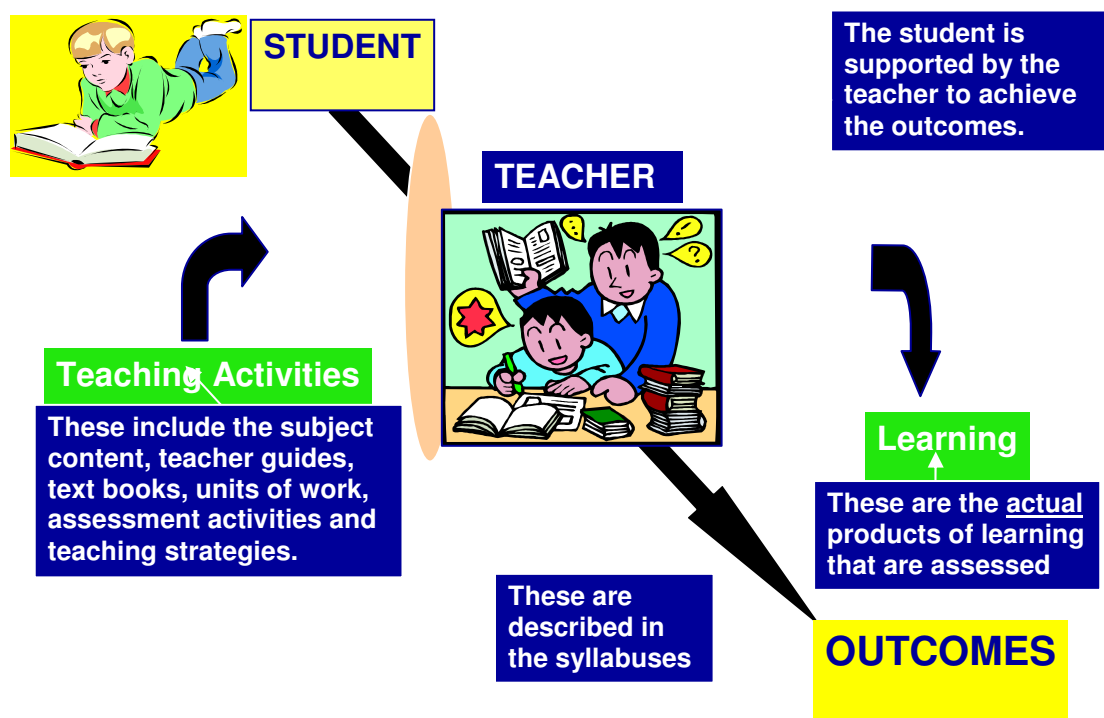
Learning area	Elementary	Lower primary	Upper primary	Lower secondary	Upper secondary
	Physical Education Design and Technology)			Design and Technology (including Home Economics, Practical Skills, Computing, Design and Technology)	(including Agriculture, Forestry, Fisheries and Integrated Natural Resource Management) Design and Technology (including Design and Technology, Practical Skills technologies, Food technology and Textile technology. Tourism Studies Computer Studies Information Communication Technology,
Language	Vernacular Language	English Vernacular language	English Vernacular language	English Library and Research skills	Applied English Language and Literature
Mathematics	Cultural Mathematics	Mathematics	Mathematics	Mathematics	General Mathematics Advanced Mathematics
Personal Development	(Aspects of Personal Development are covered under Culture and Community)	Health Physical Education	Personal Development (including Health, PE, Guidance) Religious Instruction	Personal Development (including Health, PE, Guidance) Religious Instruction	Personal Development Physical Education
Science	(Aspects of Science are covered under Culture and Community)	Environmental Studies	Science	Science	Applied Science Biology Chemistry Geology Physics

Section 2: Outcomes approach

The major change in the reform curriculum is the shift to what students know and can do at the end of a learning period, rather than a focus on what the teacher intends to teach.

An outcomes approach identifies the knowledge, skills, attitudes and values that all students should achieve or demonstrate at a particular grade in a particular subject (the learning outcomes). The teacher is responsible for identifying, selecting and using the most appropriate teaching methods and resources to achieve these learning outcomes.

Imagine the student is on a learning journey, heading to a destination. The destination is the learning outcome that is described in the syllabus document. The learning experiences leading to the learning outcomes are to be determined by the teacher. The teacher uses the curriculum materials, such as syllabus documents, teacher guides, unit samples, and assessment guidelines to plan activities that will assist students achieve the learning outcomes.



Outcomes-based education has two purposes. They are:

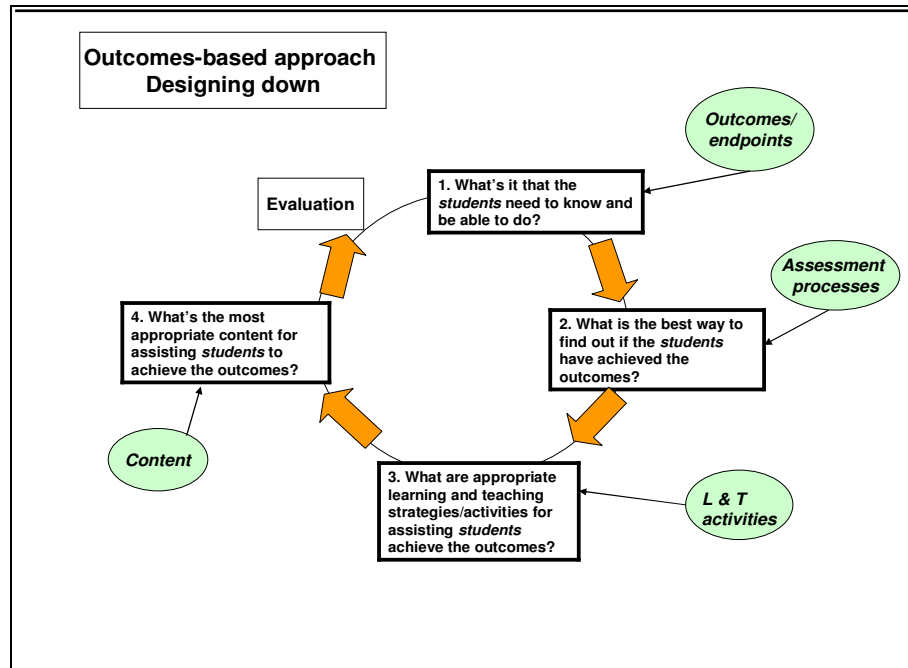
- to equip all students with knowledge, understandings, skills, attitudes and values needed for future success
- to implement programs and opportunities that maximise learning.

The three premises (assumptions) of OBE are:

- all students can learn and succeed (but not on the same day or in the same way)
- success breeds further success
- schools can make a difference.

The four principles of OBE are:

1. clarity of focus through learning outcomes - this means that everything teachers do must be clearly focussed on what they want students to ultimately be able to do successfully. For this to happen, the learning outcomes should be clearly expressed. If students are expected to learn something teachers must tell them what it is and create appropriate opportunities for them to learn it and demonstrate their learning.
2. high expectations of all students - this means that teachers reject comparative forms of assessment and embrace criterion-referenced approaches. The principle of high expectations is about insisting that work be at a very high standard before it is accepted as completed, while giving students the time and support they need to reach this standard. At the same time students begin to realise that they are capable of far more than before and this challenges them to aim even higher.
3. expanded opportunities to learn - this is based on the idea that not all students can learn the same thing in the same way in the same time. Some achieve the learning outcomes sooner and others later. However, most students can achieve high standards if they are given appropriate opportunities. Traditional ways of organising schools do not make it easy for teachers to provide expanded opportunities for all students.
4. planning and programming by designing down - this means that the starting point for planning, programming and assessing must be the learning outcomes - the desired end results. All decisions on inputs and outputs are then traced back from the learning outcomes. The achievement of the outcome is demonstrated by the skills, knowledge and attitudes gained by the student. The syllabuses and/or teacher guides describe some ways in which students can demonstrate the achievement of learning outcomes.



Learning outcomes provide teachers with a much clearer focus on what students should learn. They also give teachers greater flexibility to decide what is the most appropriate way of achieving the learning outcomes and meeting the needs of their students by developing programs to suit local content and involve the community.

The outcomes approach promotes greater accountability in terms of student achievement because the learning outcomes for each grade are public knowledge - available to teachers, students, parents and the community. It is not the hours of instruction, buildings, equipment or support services that are the most important aspect of the education process but rather, **what students know and can do as they progress through each grade.**

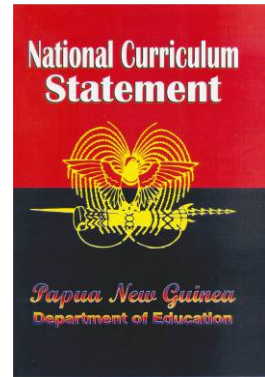
The outcomes approach means that learning

- has a clearer purpose
- is more interactive - between teacher and students, between students
- has a greater local context than before
- is more closely monitored and acted upon by the teacher
- uses the teacher as a facilitator of learning as well as an imparter of knowledge.

Section 3: Background policies and plans

National Curriculum Statement 2002

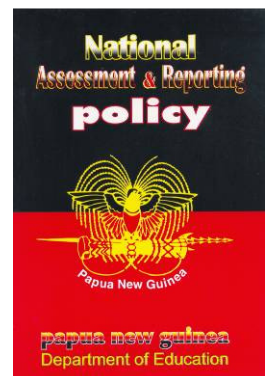
The purpose of the curriculum reform is to provide a relevant basic education for Papua New Guineans while at the same time providing specialist further education and training for those able to make use of it. *The National Curriculum Statement* for Papua New Guinea provides a national framework for curriculum development in Papua New Guinea from Elementary Prep to Grade 12, consistent with the Education Reform.



During the development of this statement, the Constitution of the Independent State of Papua New Guinea, Government Acts and many other important policies, reports and plans were analysed. In particular, this statement is based on *A Philosophy of Education for Papua New Guinea, Ministerial Committee Report*, (1986) often referred to as the Mantane Report, and the integration of current education reform ideas. In addition many educators at all levels and from all regions in Papua New Guinea were consulted and they contributed positively to this statement. This statement was written by Papua New Guineans for Papua New Guinea, and represents a major step forward for PNG's education system.

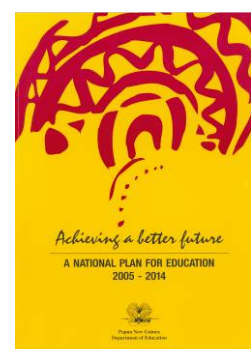
National Assessment and Reporting Policy 2003

This policy identifies the principles and practices that must be applied to the assessment and reporting of student achievement from Elementary to Grade 12. It also identifies the roles and responsibilities of those stakeholders who are most concerned with assessing students, reporting student achievements and with receiving and using student assessment information. Students, parents, guardians, members of a community, and various stakeholders have responsibilities to ensure that assessment and reporting is undertaken in ways that meet the needs of students, schools, communities, and the nation. This policy must be read and applied carefully to ensure that assessment and reporting is valid, reliable, fair and equitable.



National Plan for Education 2005 to 2014

This Plan presents the outcomes for education in Papua New Guinea and the main strategies for achieving them from 2005 to 2014. It builds on the progress made in the first *National Education Plan 1995-2004* volumes a and b, (Department of Education, 1997). It is guided by the National Goals and Directive Principles in the Constitution. The first priority is to provide the opportunity of nine years of basic education for all.

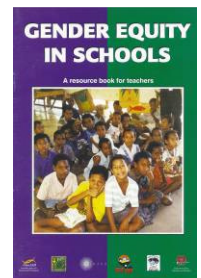
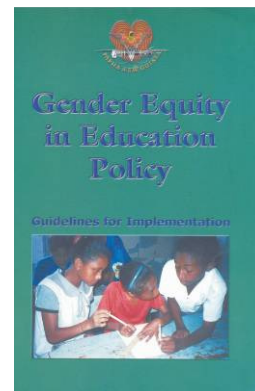


In order to complete nine years of basic education every child will have the opportunity to be educated to Grade 8. The first three years of Elementary education will be taught in the language of the community, a move that has the overwhelming support of the community.

In secondary education there will be moderate expansion in order to maintain government objectives regarding transition between Grades 8 and 9, and then Grades 10 and 11. These are 50 per cent and 25 per cent respectively. Emphasis will be placed on quality, with the development of a new curriculum and the provision of teacher training. The bulk of the increase in Grade 9 and 10 places will be as a result of the relocation of the Grade 7 and 8 classes to the primary schools. Similarly the increase will be experienced in secondary with the inclusion of grades 11 and 12.

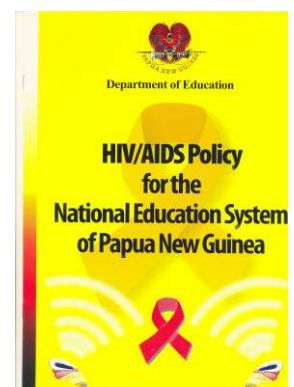
Gender Equity in Education Policy 2003

At every level of education more males are represented than females. In major studies, cultural factors have been found to be the major obstruction to increasing participation of females at all levels of education (*Gender Analysis in Papua New Guinea*, World Bank, 1998). Access to informal education and training programs is even more difficult for women who are illiterate and the literacy rate among women is estimated at around 40 per cent. Regional variations reflect differences in historical experience. Higher enrolments of girls exist in regions where single sex education was provided in the past by missions. *The Gender Equity in Education Policy* (Department of Education, 2003) provides a framework of principles and practices to improve the lives of all children and promotes gender equity between girls and boys.



HIV/AIDS Policy for the National Education System of Papua New Guinea 2005

The HIV/AIDS Policy for the National Education System of Papua New Guinea has been developed in the context of the latest data about the spread of HIV/AIDS in Papua new Guinea and the estimated impact on education and the country as a whole. The goal of the policy is for the national education system to participate effectively in Papua new Guinea's multi-sectoral response aimed at reducing the impact of the HIV/AIDS epidemic through the development, implementation, monitoring and evaluation of a comprehensive, relevant and forward thinking response to HIV/AIDS at all levels of the national education system.



The policy contains sixteen guiding principles, and implementation objectives and strategies for four key strategic areas. The objectives are:

- students acquire the knowledge and information and develop appropriate life skills to be free of HIV infection all their lives.
- schools and institutions will be positive learning environments where all infected and affected students can access information, care, counselling and support.
- work environments will be positive and proactive in the prevention of HIV in the workforce and be responsive to the needs of their infected and affected employees, by providing appropriate information, referrals, care and support.
- management structures and systems will be in place and partnerships developed and sustained, at all levels of the national education system to plan, implement and monitor quality education in the context of HIV/AIDS.

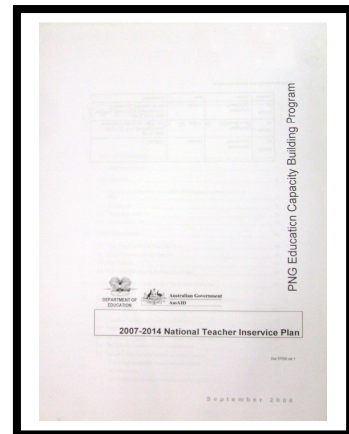
2007-2014 National Teacher In-service Plan – July 2006

The PNG Department of Education has recently overseen most significant changes to its school curriculum. These changes include what is taught, how it is taught, how it is planned for, assessed and reported on. It is likely to take 10-15 years before the required changes are properly and systemically implemented.

The scale and scope of these changes require significant, whole of system support for teachers, other members of school communities and for teacher in-service and preservice providers and managers in order to implement and sustain the curriculum reforms successfully.

This *2007-2014 National Teacher In-service Plan* has been prepared in order for the DoE to manage these changes and to ensure teachers in particular are competent and confident to adopt them in their programs and practices. It acknowledges the substantial work undertaken to date and sets a direction for the priorities, sequence, scope and management of teacher professional development for the future.

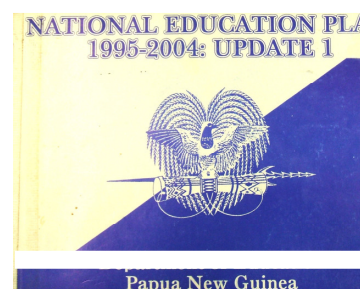
Whilst primarily directed at teacher in-service, this Plan also importantly identifies the scope and sequence of activities and resources required by additional key stakeholders. These include head teachers, senior standards officers, assessors, PTC's and others who have a role to support teacher education, training and development.



Education Plan 1995-2004

The *National Education Plan, 1995-2004* outlines a vision of the kind of preparation for life that schools must provide for the students of Papua New Guinea. The plan describes an education system that will prepare:

- the vast majority of school leavers who return to their communities where there is and always has been work and opportunities for community-based employment. The major source of employment for these citizens will be their own subsistence and small-scale, community-based commercial enterprises. Their education will have prepared them and/or their parents for this reality.
- those school leavers who will find paid employment in the slowly increasing government, private business and service industries. Their education will have provided them with the academic, technical and vocational skills that will allow them to participate in tertiary education.
- the small number of students, like those of any other nation, who will perform at top international standards.
- the growing number of marginalised rural and urban youth facing realities of life in these situations.



Language policy - The Purpose and Future Direction for Language Use in School

One of the aims of the Education Reforms is to allow the use of vernacular languages in the formal school system as stated in Secretary's Circular No. 1/91. The language of the community, together with its cultures, spiritual and work practices forms the basis for the activities of the school. This means that the local vernacular or a language spoken by both the students and their teachers, will be used as a medium of learning in the formal school system. This will strengthen cultural bonding between children and the community and enable better academic achievements.

Students will gradually bridge to English from Grades 3 to 5. From Grade 6 and at the Secondary level (ie, Provincial High Schools, Secondary Schools, National High Schools, including Vocational Schools) lessons will be conducted in English. However, advantage should be taken where opportunities arise for students to further develop their oral and written vernacular (or lingua franca) skills, or if a concept can be better explained using the vernacular or lingua franca.

Whereas children must be encouraged to learn and use English, all schools at all levels should not discourage free communication in vernacular languages that the

children speak in and out of school grounds. This will establish confidence in students to use vernacular in their learning.

Section 4: Implementation messages, roles and responsibilities

Principals

Successful implementation of education reform at all levels depends to a great extent on the leadership capacity of the principal/head teacher. Successful schools have leaders who focus on

- students and their learning and achievement
- creating effective learning environments
- shared decision-making and values
- supporting teachers as they develop new practices and understandings about learning and teaching
- providing opportunities for staff development and training
- providing appropriate resources and infrastructure
- improving parent and community relations
- collaborative planning and consultation with all stakeholders.

The principal must have a clear understanding of

- NDOE policies and plans relating to education reform
- the education reform process
- the answers to commonly asked questions.
- the importance of the reform curriculum
- the outcomes approach to learning and teaching
- the requirements and content of all subjects
- the implications of the new syllabuses for current practice
- support that is available for teachers
- processes for monitoring, evaluation and assessment of students
- processes for counselling students and reporting to parents.

Pre-service and practicing secondary and national high school teachers

Teachers are the key to the successful implementation of the reform. Their main responsibility is to provide more relevant learning opportunities with an emphasis on the application of knowledge and development of skills, and to assist students to develop appropriate attitudes and values.

Teachers must become familiar with:

- the National Curriculum Statement, the National Assessment and Reporting Policy and other policy documents and plans.

- the education reform process
- the answers to commonly asked questions.

All teachers must understand

- the importance of the reform curriculum
- the outcomes approach to learning and teaching
- their subject learning outcomes
- their own and other syllabuses and teacher guides.
- the implications of the new syllabuses for their current practice
- support that is available for teachers
- the importance of planning and working with colleagues
- processes for monitoring, evaluation and assessment of students achievements of learning outcomes
- processes for counselling students and reporting to parents.

Teachers can gain support by working with professional learning teams and colleagues within the school, with resource personnel in their district or province, and with senior standards officers and community leaders to plan for and implement the new curriculum.

Boards of Governors and Governing Councils

An active partnership between the Board of Governors/Governing Councils and the principal and school community is necessary to ensure effective implementation of the reform curriculum.

Board members must

- understand the importance of structural and curriculum reform
- be familiar with the DOE policies and plans underpinning the reform
- provide sound management of school resources, finances and infrastructure
- liaise and plan collaboratively with other stakeholders such as PEA, LLGs, DEA to ensure schools are staffed and resourced appropriately to meet reform requirements
- ensure the schools implement reform curriculum and policy changes.

Provincial education authorities (PEA, LLG, DEA, PEB)

Active involvement and participation of provincial education authorities at all levels is necessary to ensure effective implementation of all aspects of the education reform.

Provincial education authorities must

- be familiar with the DOE policies and plans underpinning the reform

- implement the structural changes required by the reform
- provide necessary facilities such as classrooms, libraries, workshops for practical skills
- provide logistical support such as communication and transport
- ensure schools are staffed appropriately to meet reform requirements
- provide funding for staff development and training to assist teachers to successfully implement the reform curriculum
- plan collaboratively with other stakeholders
- ensure the schools implement reform curriculum and policy changes.

Parents, guardians and the community

Parents, guardians and the community are active partners in the learning and development of their children. They need to know about the content of the reform curriculum, the implications for their children and how they can help.

School leaders and education authorities must tell parents, guardians and the community information about

- the reasons for the reform curriculum
- the subjects in the curriculum and their status
- the expected outcomes of the curriculum (end result of curriculum and its emphasis)
- how subjects will be taught
- how students will be assessed in the curriculum.
- what is different about the new curriculum
- continuity of learning from elementary to secondary.

Parents and guardians can help their children develop appropriate knowledge and skills most effectively by

- ensuring both their sons and daughters attend school.
- having realistic expectations of their children
- guiding and counselling their children through decisions affecting their future career, health and well-being
- caring for and safe guarding school facilities
- paying fees and fund raising to resource the school
- helping with school projects and the developments of both traditional and modern skills
- recognising that the curriculum provides a balance of knowledge, skills, attitudes and values for both academic progress and life in the community.

Secondary students

Secondary students are responsible for much of their own learning and must make choices for their future. They need to know

- about available subjects
- about subject and learning outcomes
- about assessment components and weightings
- about examinations, certification and options after Grade 12
- what is expected of them in terms of attitude and behaviour.

Secondary students must be prepared to

- actively pursue the achievement of learning outcomes
- take ownership of and responsibility for their own learning
- apply their knowledge and skills in learning and assessment activities
- make informed choices in terms of potential and interest when selecting options
- become resourceful and responsible citizens.

Senior Standards Officers

Senior standards officers play key roles in curriculum implementation and appraisal of whole school performance. These include promoting the education reform in schools and communities, monitoring curriculum implementation and supporting and/or assisting with teacher development.

Senior standards officers must have a clear understanding of

- the importance of structural and curriculum reform
- NDOE policies and plans relating to structural and curriculum reform
- the answers to commonly asked questions
- the outcomes approach to learning and teaching
- the requirements and content of all subjects
- the implications of the new syllabuses for current practice
- support that is available for teachers
- processes for monitoring, evaluation and assessment of students
- processes for counselling students and reporting to parents.

Guidance officers and school counselors

The main role of guidance officers and school counselors is to provide advice to students and their parents on career pathways, subject choices and subject combinations. School counselors also counsel students on issues such as HIV/AIDS, drug taking, behaviour management, conflict resolution and personal problems. Guidance officers also provide professional empowerment training for staff and counsellors and conduct scholastic aptitude tests in schools.

Guidance officers and school counsellors must be able to explain to students, parents and the community

- the reasons for the reform curriculum
- what is different about the new curriculum
- the expected outcomes of the curriculum
- the subjects in the curriculum, their status and how they will be taught
- how students will be assessed in the curriculum.
- continuity of learning from elementary to secondary.

All stakeholder groups involved in upper secondary education can utilise a range of resources to obtain additional information about curriculum and structural reform in education in Papua New Guinea. (See Appendices 1 and 2)

Section 5: Upper secondary curriculum framework

The subjects

The curriculum has been designed using nine (9) subject fields. Currently there is one syllabus and teacher guide for each subject except for Computer Studies and Information Communication Technology which have one teacher guide. Students must study a total of five (5) subjects plus Personal Development or Religious Education.

Most subjects have equal status and have equal timing of 240-250 minutes per week except Personal Development and Religious Education with 80-100 minutes per week and Advanced Mathematics which has 400 minutes per week.

Subject Fields	Subject	Minutes per week
Language	Applied English Language and Literature	240-250 240-250
Mathematics	General Mathematics Advanced Mathematics	240-250 400
Personal Development	Personal Development Physical Education Religious Education	80 -100 240-250 80-100
Agriculture	Applied Natural Resource Management	240-250
Art	Music Theatre Arts Visual Arts	240-250 240-250 240-250
Business Studies	Business Studies Accounting Economics	240-250 240-250 240-250
Design and Technology	Design and Technology - Design and Technology - Practical Skills technologies, - Food technology - Textile technology. Tourism Studies Computer Studies Information Communication Technology	240-250 240-250 240-250 240-250 240-250 240-250 240-250
Science	Applies Science Biology Chemistry Geology Physics	240-250 240-250 240-250 240-250 240-250
Social Science	Geography History Legal Studies	240-250 240-250 240-250
Minimum time		1280

Subject Pattern

All students **MUST** study an English subject, a Mathematics subject and Personal Development or Religious Education. English and Mathematics provide a literate and numerate foundation for learning. Personal Development or Religious Education incorporates aspects of guidance, religious studies, health and social issues crucial to Integral Human Development as described in the Philosophy of Education.

Students select three other subjects from the list (p 23). The five subjects selected by students for study will provide a foundation to what they want to do after they leave the formal education system or what they will study further if they get a placing to do further studies in a higher institution. Students should be guided by strong counselling when choosing their Upper Secondary subjects.

All schools are required to allocate two periods a week to Personal Development or Religious Education.

Schools select subjects that are most relevant for their students and which align with community and provincial resources.

Implementation timeframes

2009	Syllabuses and teacher guides will be printed and distributed to schools
2009	Schools/teachers use in service opportunities to familiarise themselves with reform curriculum content and requirements
2010	Implementation starts with Grade 11
2011	First new Upper Secondary School Certificate Examination

Syllabuses and teacher guides

The upper secondary reform curriculum contains some current subjects that have been revised and/or updated and some new subjects and/or subject names.

The syllabuses

The new syllabuses include the rationale and aims for the subject; learning outcomes for the subject; a content overview; the Grade 11 and 12 units; and information about assessment, examinations and certification. The learning outcomes identify the knowledge, skills, attitudes and values that all students achieve or demonstrate by the end of Grade 12.

Rationale: The rationale is a statement of justification for the subject. It establishes the subject's importance and relevance and its place in the curriculum at each level. It also explains why studying it will contribute to the achievement of the overall goals of the Papua New Guinea curriculum.

Aims: Syllabus aims describe in broad terms the knowledge, skills and attitudes students should develop by studying a subject.

Content Overview: This section lists the learning outcomes to be achieved by the end of Grade 12 and a description of the strands that describe the dimensions of the subject. This section also describes the unit sequence and structure.

Each syllabus contains a number of structured units for Grades 11 and 12. Each unit lists the learning outcomes for the unit, the content that will assist students achieve the learning outcomes and the assessment requirements for the unit. The learning outcome statements describe one or more concepts and processes that students can achieve in different ways and in different contexts. Assessment components and weightings ensure consistency across PNG for the awarding of the Upper Secondary School Certificate.

The teacher guides

The teacher guides are designed to assist teachers implement the subjects. Teachers should read their guides thoroughly to become familiar with the contents before planning for the year.

Teacher guides provide detailed information about the structure of the subject. A variety of teaching and learning strategies are included to enable teachers to make learning interesting and enjoyable.

The teacher guides provide sample performance standards and marking guides for 2 sample assessment tasks to ensure assessment is valid and reliable. Performance standards must be used by teachers to make judgements about student achievement of learning outcomes. An example of how to use marks to make an overall judgement is included as a model.

The guides include examples of student-centred activities to help teachers develop their own detailed teaching programs and lesson plans. They also list or describe the resources needed for each unit.

Teachers may use this guide to help you through planning and programming

Step 1 - Look at what the learning outcomes mean, and plan what the teacher has to do to help students achieve the learning outcomes.

Step 2 - Develop an assessment plan using the assessment components and weightings.

Step 3 - Look at the content of the unit, the activities that can be used when teaching the unit.

Step 4 - Elaborate on the unit content and select/suggest some activities the teacher might like to use.

Assessment, examinations and certification

Assessment and reporting practices described here are detailed further in the Upper Secondary School Certificate *Examination Handbook*, *The National Assessment and Reporting Policy for Papua New Guinea* (2003), the upper secondary subject syllabuses and teacher guides and in other support materials produced by the Department of Education.

Assessment

The main purpose of assessment is to improve student learning. Assessment needs to be for learning as well as of learning. It is used to evaluate and improve learning and teaching, report achievement and provide feedback to students on their progress. Assessing in an outcomes curriculum involves focusing less on whether a learner has "passed" or "failed" and more on what learning outcomes a learner has achieved and in which areas further support is required.

Assessment measures students' achievement of learning outcomes as described in the syllabus. It is the ongoing process of identifying, gathering and interpreting information about students' achievement of the learning outcomes. A student's achievement in each subject at the end of Grade 12 will be assessed against the learning outcomes.

Internal assessment

The internal assessment marks are to be based on the upper secondary subject syllabus. Final assessment should be based on a range and balance of assessment instruments. The components and weightings for grade 11 and 12 are detailed in the syllabus.

Teachers will use the assessment components and weightings to ensure that there is a common focus for internal assessment while allowing for flexibility in the design of tasks. They will expand on chosen task(s) and provide clear guidelines to students on how the task will be completed. This is to improve the validity and reliability of the assessment.

Performance standards

Student achievement is recorded and reported against standards. Teachers can use the sample performance standards provided in the *Teacher Guide* when making a decision about the achievement of students in relation to the learning outcomes. Teachers must develop performance standards for every task set. The performance standards describe the level at which the student has to be working to achieve a particular standard or mark.

Students should always have access to a copy of the assessment criteria and the performance standards so that they know what it is they have to know and be able to do to get a good mark in a particular task. The performance standards help teachers in their marking and help students improve their performance in

the future. Performance standards are useful when providing feedback to students and parents as they explain what it is the student needs to do to improve.

Recording and reporting

When recording and reporting student achievement teachers must record the achievement of the students in each unit and then, at the end of the year make a final judgement about the overall achievement, or progress towards achievement, of the learning outcomes. To help teachers do this, descriptions of the levels of achievement of the learning outcomes are provided in the Learning Outcome Performance Standards in the subject *Teacher Guide*.

When reporting to parents, the school will determine the method of recording and reporting. In an outcomes based system, student results should be reported as levels of achievement rather than marks.

Assessment for the Upper Secondary School Certificate

A student's overall achievement in each subject will be both internally and externally assessed. The mark awarded to each student for the Upper Secondary School Certificate will be a combination of the internal assessment mark provided by the school and the external examination mark.

The internal assessment marks provide a summation of each student's achievements in Grades 11 and 12. Assessment is continuous and is criterion based.

There will be a national examination at the end of grade 12 for certain subjects. The external examination provides a measure of student achievement of those aspects of the learning outcomes that can be reliably measured in an examination setting. Questions for the external examination in subjects will be developed using the learning outcomes, knowledge and skills in the units. The first examination of the new curriculum will take place in 2011.

Candidates will be awarded an Upper Secondary School Certificate only if they meet all requirements for internal and external assessment. Eligibility rules for the award of the Upper Secondary School Certificate are specified in *Upper Secondary School Certificate Handbook*.

Section 6: Managing curriculum change

The changes

- New syllabuses and teacher guides
- Revised and/or updated subject content
- New subjects or subject names (such as Accounting, Computer Studies, Geology, Tourism Studies)
- New ways of planning and programming
- New assessment policies and practices
- Teaching that focuses on the application of knowledge and development of skills
- Different timetabling and subject requirements

Change management

Introducing a change as important as implementing the new upper secondary curriculum is complex. A great deal of research has been undertaken on change management. Listed below are some findings you should take into account as you undertake the implementation of this important change.

- Change is a complex process that requires thoughtful planning.
- All change creates feeling of anxiety in the people who have to implement the change. Everyone needs support when they become anxious or worried by the change process.
- The change process is unpredictable even if it has been planned carefully. Everyone must be willing to respond in a flexible manner if things do not go according to plan.
- Things sometimes get worse before they get better. Because change involves unlearning old ways and methods and learning new ways of doing things teaching practices may get worse for a short period of time.
- Effective and long lasting change takes time and persistence. Do not give up! Keep learning!

Curriculum change is not just about learning materials. It involves changes in teachers' practices or behaviour and changes in teachers' beliefs and understanding. It takes time for the teachers to change their teaching practices by introducing new activities, and to change their skills, behaviours, beliefs, and understandings.

Teachers will not change overnight as a result of having the documents on hand. **Implementing changes such as these is a process that will take time.**

The professional management learning team

A number of people in each school have been trained to help schools/teachers manage the change process. They are known as the professional management learning team and may include key people such as the Principal, deputies, subject heads and the in service coordinator and teachers committed to moving reform forward (ideally 4-7 members).

The professional management learning team is responsible for:

- sharing their learning with their colleagues
- making the transition from old to new approaches as smooth as possible by planning small and realistic steps
- supporting teachers with professional assistance
- coordinating and conducting school in service programs on a regular basis
- monitoring and evaluating progress and liaising with SSO
- conducting awareness to stakeholders, (parents, BOG, student and so on)
- organising assistance from professional learning teams of nearby schools, elders, senior standards officers , district officers, PIC's and so on
- carrying out action research for school improvement.

School based in-service

Changing the current teacher dominated instruction in PNG classrooms is the most critical challenge to successful implementation. Outcomes approaches to planning, programming, teaching, assessing and reporting are different from what teachers have been used to. Teachers are now required to adopt a student-centred teaching pedagogy, with clearly articulated criterion referenced standards and explicitly stated learning outcomes.

Teachers should be encouraged by their Principals to develop learning communities where there is a professional exchange of ideas and experiences. Teachers must start by identifying and using the resource materials and knowledge within their schools and sharing their knowledge and expertise with colleagues. Such collegiality is critical to the success of curriculum reform and effective professional development. It also underpins the longer term goals of

schools being semi-autonomous and self reliant, recognising and using their internal expertise wherever possible.

International research and experience show that repetition, practice, ongoing support and consolidation are required for sustainable changes to be made to teaching methods. School based in-service is an organised and scheduled method of providing such support and consolidation.

School based in-service needs to be carefully planned. It is currently about 40 minutes/50 minutes (1 period) in duration. However it can be scheduled outside the school's timetable and it is recommended that sessions be at least one hour to ensure time to absorb and consolidate new learning and to complete specific learning activities. The in-service plan should include information regarding the target group, type of in-service activity, cost, venue, resources, data, facilitator and so on.

It is not enough however to draw up an in service plan. The plan must be implemented, monitored and reviewed. In service must take place regularly.

School based in service could include staff meetings that involve guest speakers and professional discussions; observations and demonstrations of student-centred teaching strategies; shared planning and programming sessions; small group activities selected from in-service materials; presentations and activities on specific topics. In-service activities could be conducted by a variety of resource personnel including teachers within the school, community members, staff from other schools with successful programs such as IEA schools; teachers and assessors from neighbouring high schools; senior standards officers ; lecturers from teacher education institutions.

Section 7: Implementing the Curriculum

Essential requirements

It is essential that each teacher has a copy of the relevant syllabus and teacher guide. Print copies of these will be supplied on the basis of the number of grade 11 and 12 classes in the school. Schools will also receive an electronic master copy of a range of documents and can print additional copies of these as required.

The following pages outline the essential requirements of each subject in the curriculum. Schools must be able to meet these requirements to offer subjects such as Applied Natural Resource Management, Design and Technology, Information Communication Technology and others which require specific resources.

Accounting requirements

There are four units in *Grade 11*, which all students must complete. There are three units in *Grade 12*, which all students must complete. There are also two assessment tasks, which must be completed by students.

Grade	Weeks	Term	Unit	Resources for activities and assessment
11	6	1	11.1 Single Entry Accounting	Calculator Text book: Introduction to Accounting <ul style="list-style-type: none"> • Sample profit and loss statements • Sample book keeping forms and documents • Sample bank statements, cheque books, and forms
	4	1	11.2 Petty Cash	<ul style="list-style-type: none"> • Sample petty cash books and vouchers
	15	2 -3	11.3 Introduction to Accounting	<ul style="list-style-type: none"> • Samples of personal documents • Sample application forms, templates and letters • Sample balance sheets Test papers, task instructions, marking guidelines
	13	3 - 4	11.4 Double Entry Accounting	<ul style="list-style-type: none"> • Samples of source documents and business documents • Samples of charts of accounts from both private business and government departments
12	15	1 - 2	12.1 Journals	<ul style="list-style-type: none"> • Samples of different types of journals including specialised journals and general journals • Samples of general ledgers and subsidiary ledgers • International Federation of Accountants Guidelines and Standards
	10	2 - 3	12.2 Final Reports	<ul style="list-style-type: none"> • Examples of quarterly budget reports • government reports • Samples of profit and loss statements • Samples of balance sheets from government and non-government agencies • Samples of cash flow statements
	10	3 - 4	12.3 Assessing Business Performance	<ul style="list-style-type: none"> • Examples of key performance indicators both financial and non-financial from government and non-government agencies

Applied English requirements

There are four units in *Grade 11* which all students must complete. There are three units in *Grade 12* which all students must complete. There are also assessment tasks.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Introduction to Communication	Poetry Short stories Drama
	10	2	11.2 Introduction to Media	Newspaper or magazines articles Documentary or television shows Feature films
	10	3	11.3 Cultural Studies: Part 1	Definition and research Novel
	10	4	11.4 Cultural Studies: Part 2	Reference books Textbooks Reports Newspaper or feature articles Documentaries
12	10	1	12.1 Applied Writing	Issues or opinions Documents, reports, media Creative or reflective writing
	10	2	12.2 Focus on Literature	Drama Poetry Novel or short stories
	10	3	12.3 Biography	Biography Biographical film

Advanced Mathematics requirements

This is one of the required Mathematics subjects. It is an option for students who are gifted in Mathematics. It is to be programmed for 400 minutes per week.

There are four units in Grade 11 and three units in Grade 12 which all students must complete. Assessment components, weightings and tasks are in the syllabus.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Number and Application	Bathroom scale, measuring instruments (analogue/digital), mass sets, meter ruler, conversion tables, grid papers
	12	2	11.2 Graphs and Functions	Scientific calculator, grid papers
	10	3	11.3 Managing Data	Data from LLG and other government organisations, Dice, deck of cards, domino.
	8	4	11.4 Geometry	Maths kit, trundle wheel, tape measure
12	10	1	12.1 Patterns and Algebra	Scientific calculators, grid papers
	10	2	12.2 Trigonometry and Vectors	Tape measure, clinometer, measuring instruments (analogue and digital such as clocks)
	10	3	12.3 Calculus	Grid papers, scientific calculators, pendulum, balls strings, tape measures

Applied Natural Resource Management requirements

Agriculture requirements

There are six units in Grade 11 and four in Grade 12, which all students must complete. There is one optional unit in Grade 12. There is one example of an assessment task for each grade. For the rest of the units, teachers are expected to develop assessment tasks.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Introduction to Agriculture	Commodity export data (PNG Bank Quarterly Bulletin), resource personnel, brochures from various Institutions. Chart papers, posters
			11.2 Soil Management	Farmland, tools, planting materials, nursery materials, agricultural chemicals, animal manures and so on
	11	2	11.3 Annual Crop Production	Day-old chicks, buildings, feed, feeders, water troughs, equipment, feed chart, farm land paddocks, resource personnel
	10	3	11.4 Animal Production (Monogastrics)	Basic tools, equipment and machinery, draught animals, implements, buildings
	10	4	11.5 Farm Technology	Land, tools, equipment, water, market outlets, sample records, blank forms, case study reports, farm map, infrastructure plans
			11.6 Agribusiness	Blank forms, markets, samples of agriculture products, resource personnel, existing cooperate bodies
12	10	1	12.1 Applied Farm Management	Land, sample records, case study reports, resource personnel, nursery materials, livestock, planting materials, labour, tools and equipment, farm buildings
	11	2	12.2 Introduction to Applied Research	Worksheets, sample research reports, resource personnel, research materials
			12.3 Perennial and Biannual Crop Production	Land, water source, labour, nursery materials, existing plantations, chemicals, tools and equipment, farm buildings, storage facilities
	10	3	12.4 Animal Production (Polygastrics)	Soil testing kit, land, measuring equipment, chemicals, fertilizers, soil scientists, standard survey equipment, irrigation equipment and materials

Forestry requirements

There are four units in Grade 11, which all students must complete. There are five units in Grade 12, which all students must complete. There are also two assessment tasks which must be completed by students.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Introduction to Forestry	Papua New Guinea Forest Quarterly Report, chart papers, planting materials, land and nursery area
	6	2	11.2 Introduction to Tree Science	Chart papers, tree species specimen, pictures of important tree species, herbarium if possible, and local Forestry officer
	25	2,3,4	11.3 Plantation Silviculture	Poly-bag, soil mixture, seed trays and boxes, watering can, pruning saws, secateurs, budding knives, biochemicals
	3	4	11.4 Forest Conservation	A natural forest area, publication materials on Papua New Guinea forest conservation sites, botanical garden sites
12	9	1	12.1 Measurements	Tape measure, survey and mapping equipment, compass
	12	2	12.2 Harvesting Processing and Marketing.	Chainsaw, tree-harvesting procedure flow chart, timber milling flow chart, information on forest trading in Papua New Guinea and overseas, timber treatment chemicals and storage facilities
	2	3	12.3 Forestry Economics and Marketing	Samples of forest tree products, information on Papua New Guinea Forestry government policies, imports and exports data
	6	3	12.4 Agroforestry	Cartridge paper, coloured marker pens, rulers and equipment for drawing circles and half circles for writing agrisilviculture and silvipastoral posters. Tree seeds or seedlings
	3	4	12.5 Introduction to Applied Research	Handouts on quantitative and qualitative research, calculators, simple survey equipment

Fisheries requirements

There are eight units in Grade 11 which all students must complete. There are five units in Grade 12 which all students must complete. There are also two assessment tasks which must be completed by students.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Introduction to Fisheries	Fishery profiles of Papua New Guinea fisheries (electronic copies available from NFA). Papua New Guinea EEZ map, map of GOP fishery, map of barramundi fishery, NFA corporate plan Fisheries export data (BPNG quarterly bulletin, NFA export data summary by species),
		2	11.2 Marine Biology 1	Aquatic environment with abundance of wildlife for students to research basic stock, and behaviour of fish stocks as a result of fishing pressure River or sea environments with plants and animals Fishing equipment Boats, rope, small outboard or inboard engines Materials to construct fish ponds, dams or cages
		3	11.3 Fishing Technology 1 11.5 Aquaculture and Mariculture 11.6 Fisheries Management	Fish farming manuals (for example, trout, tilapia, carp, barramundi); seaweed and carp Materials for ponds and cage construction (spades, pipes, nets, floats, sinkers) Digestive system of different fish; for example, carnivore, herbivore and omnivore) Aquaculture seed; fingerlings of carp, tilapia, trout, barramundi and prawn post larvae Aquaculture feed: commercial fish feeds or chicken pellets, feed making ingredients (fish meal, rice bran, wheat bran, copra meal), (small grinder and mincer for pelleting feed) Organic and inorganic fertilisers for natural food production; for example, poultry and livestock manure, composting wastes and commercial fertilisers Fisheries Management Act and Fisheries Management Regulations, National Aquaculture Development Policy, Translocation Policy and Quarantine Policy Fisheries Management Plans (tuna, bêche de mer, life reef fish, aquarium, saratoga, barramundi, Gulf of Papua prawn fishery, lobster, Trial Fishing Policy and pump boat fishery) Brochures on responsible fishing (no dynamite), use of gill nets, seasonal closures and bans
		4	11.7 Handling, Processing and Storage	Guidelines on good hygiene and sanitary practices in food handling and processing EU HACCAP standards available from NFA, 'General Cleanliness Guidelines' for seafood handlers, information on seafood handling and spoilage
12		1	12.1 Introduction to Applied Research	Rationale, Principles of Research, methods and designs, project areas

		1	12.2 Marine Biology 2	Marine ecosystems, sample of seawater, microscopes, sample of common marine organisms, samples of major mangrove species, access to estuaries, seagrass beds, coral reefs and open oceans
			12.3 Fishing Technology 2	Types of nets, assembly and repair of damaged netting, haevering fish
			12.5 Fisheries Extension	Collect relevant information from the NFA office, statutory bodies and other relevant offices

Integrated Natural Resource Management requirements

There is only one unit in *Grade 11*, which all students must complete. There are two units in *Grade 12*, which all students must complete. There are also two assessment tasks which must be completed by students.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	20	1 and 2	11.1 Integrated Farming 1 Enterprise 1: For example: broiler chickens, tilapia fish and rice project	Fish pond, poultry house built over the fish pond, tilapia fingerlings, day old broiler chicks, rice seeds or seedlings, feed
	20	3 and 4	Enterprise 2: For example: vanilla, coffee trees and honey bees project	Vanilla cuttings, nursery house, well mixed organic soil, coffee seeds or seedlings, all the materials or equipment needed for honey bees farming, a piece of arable coffee garden land
12	20	1 and 2	12.1 Integrated Farming 2 Enterprise 3: For example: coconuts, bananas and vegetables project	A piece of arable land, high yielding coconut variety seeds or seedlings,, banana suckers, vegetable seeds or seedlings
	15	3 and 4	Enterprise 4: For example: fish, turtles and pearl farming project	A reef, different species of marine fish, young turtles, equipment or materials for growing pearls

Applied Science requirements

There are six units in Grade 11 and four units in Grade 12 which all students must complete. There are also assessment tasks

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	1-2	1	11.1 Introduction to Applied Science	School Library, Newspapers, blank papers, folders.
	5-6	1	11.2 Traditional technology	Traditional artefacts, tools, variety of traditional food, local dyes, resource personnel, library,
	8-10	1 - 2	11.3 Energy Around Us	Models, photocells, connecting wires, magnets, copper plates, light bulbs & holders, library, resource personnel
	5-6	2 - 3	11.4 Hydrology	Local water supply system, variety of water sources, microscopes & slides, calcium compounds, soap, gas, Bunsen burner,
	8-10	3 - 4	11.5 Environmental Management	Resource personnel, library, posters, brochures, videos, water test kits, indicators, pH kits,
	5-6	4	11.6 Health Science	Health posters & books, resource personnel, charts, models, First Aid Kit, pregnancy test kit, HIV AIDS test & VCT centres,
12	5-6	1	12.1 Modern Electronic Communication	Electronic devices, electronic tools set, connecting wires, capacitors, transistors, diodes, resistors, electronic circuit boards, electromagnets, power packs,
	8 -10	1-2	12.2 Food Technology	Samples of processed foods, samples of packaging materials, iodine solution, ethanol, Benedict's solution, copper sulphate solution, GCSE Biology text book,
	8 -10	3	12.3 Biotechnology	Variety of oily nuts, jars with lid, sifter, caustic soda, grater, scraper, oil, mould
	8-10	3-4	12.4 Mineral Products	Lime concentrate, cement, sand, limestone, coral, shells, fire wood, empty containers, brick mould

Biology requirements

There are six units in Grade 11 and four units in Grade 12, which all students must complete.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	4–5	1	11.1 Living things	Plant and animal specimens, round onions, models of plant and animal cells, microscopes, charts, posters
	8–10	1–2	11.2 Nutrition	Food test solutions, food samples, human torso, dissection kit, stains and dyes, charts and posters, microscope, alcohol, model of leaf structure, media articles
	6–8	2	11.3 Transport systems	Eosin dye, microscope, slides, tadpoles, mammalian heart, human torso, food colouring, pok choy
	4–6	2–3	11.4 Respiration and Gas Exchange	Models of organisms, mammalian lungs, fish gills, model of leaf structure
	6–8	3–4	11.5 Response to Stimuli	Hormones (auxin, florigen, rootagen), live plant specimens, human torso, charts and posters
	6–8	4	11.6 Reproduction	Charts, posters, a small mammal, models, HCl, flower, cuttings of plants, seeds. Hospital data, internet, library books
12	8–10	1	12.1 Ecology	Soil testing kit, water quality testing kit, soil samples, visking tubing (dialysis tubing), posters, flow charts
	4–6	2	12.2 Population	Quadrats, animal and plants population species
	8–10	2–3	12.3 Genetics	Models, charts, plant tissues (carrots or others)
	6–8	3–4	12.4 Evolution	Fossils, styrofoam, cardboard, modelling clay, paint, wire, glue, plasticene

Business Studies requirements

There are four units in Grade 11 and four units in Grade 12 as prescribed in the Upper Secondary Business Studies Syllabus. All students taking Business Studies in Grades 11 and 12 must complete a total of eight units by the end of Grade 12. As teachers, you are to ensure that students are taught the units in a sequential order, as given on page 6 of the Business Studies Syllabus.

This teacher guide contains two sample assessment tasks, which must be completed by all students. You will decide how best you can assist your students to complete these tasks. You may need to choose an appropriate and relevant situation for your students. You must write clear task instructions for students to carry out the assessment tasks and ensure that a marking guideline is written for all teachers teaching the same grade to use.

Grade	Weeks	Term	Unit	Resources for activities and assessment
11	10	1	11.1 Preparing for the Future 1 (4 weeks) 11.2 Business Organisation and Management (6 weeks)	<ul style="list-style-type: none"> • Strength and Weakness checklist (adapt from LS BS Teacher Guide) • Clear file or manila folder • Samples of personal documents • Sample application forms, templates and letters • VCE Business Management Units 1&2 • Commerce in SOSE: An outcomes approach • Test papers, task instructions, marking guidelines
	10	2	11.2 Business Organisation and Management (2 weeks) 11.3 Business Start-up and Management (8 weeks)	<ul style="list-style-type: none"> • Start and Improve Your Business Programme—SBDC • Know About Business—SBDC • Commerce in SOSE—An outcomes approach • VCE Business Management Units 1&2 • Test papers, task instructions, marking guidelines
	10	3	11.3 Business Start-up and Management (2 weeks) 11.4 Small Business Management (8 weeks)	<ul style="list-style-type: none"> • VCE Business Management In Action • Commerce in SOSE—An outcomes approach • VCE Business Management Units 1&2 • Sample basic office equipment • Test papers, task instructions, marking guidelines
	10	4	11.4 Small Business Management (10 weeks)	<ul style="list-style-type: none"> • Start Bookkeeping—Rita Plukes • Commerce in SOSE—An outcomes approach • VCE Business Management Units 1&2 • Test papers, task instructions, marking guidelines
12	10	1	12.1 Communication Skills and Management (10 weeks)	<ul style="list-style-type: none"> • Business Communication and Technologies in a changing world • Sample basic office equipment • Commerce in SOSE—An outcomes

				approach <ul style="list-style-type: none"> • Test papers, task instructions, marking guidelines
	10	2	12.2 Managing Operations (10 weeks)	<ul style="list-style-type: none"> • Commerce in SOSE—An outcomes approach • VCE Business Management Units 1&2 • Test papers, task instructions, marking guidelines
	10	3	12.3 Managing People (10 weeks)	<ul style="list-style-type: none"> • Commerce in SOSE—An outcomes approach • VCE Business Management Units 3&4 • Test papers, task instructions, marking guidelines
	2	4	12.4 Preparing for the Future 2 (2 weeks)	<ul style="list-style-type: none"> • Clear file or manila folder • Samples of personal documents • Sample application forms, templates and letters • Test papers, task instructions, marking guidelines

Chemistry requirements

There are five units in Grade 11 which all students must complete. There are five units in Grade 12 which all students must complete. There are also two assessment tasks which must be completed by students.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	6-7	1	Application of physical processes	Glass tube, cork, thermometer (110 °C) distillation kit, magnet, centrifuge, beaker, test tube, filter paper, separating funnel, concentrated hydrochloric acid, concentrated ammonia, soluble salt.
	6-7		Chemical and Metallic Bonding	Models, plasticine and clay to make models, potassium permanganate, carbon tetrachloride, sodium chloride, naphthalene
	6-7	2	Chemical and Metallic Bonding	Models, plasticine and clay to make models, potassium permanganate, beaker.
	6-7		Types of Chemical Reactions	Magnesium ribbon, iron, zinc, copper sulfate, hydrochloric acid, silver nitrate, beaker, test tube, safety glasses, gloves, soap to wash hands, Bunsen burner, thongs, test tube holder, gauze
	6-7	3	Types of Chemical Reactions Energy and Reaction Rates	Magnesium ribbon, iron, zinc, copper sulfate, diluted hydrochloric acid, silver nitrate, beaker, test tube, safety glasses, spatula, water, gloves, soap to wash hands, Bunsen burner, thongs, test tube holder, gauze Calcium carbonate, magnesium ribbon, hydrochloric acid, thermometer (110 °C), gas syringe, balance, stop watch, safety glasses, gloves, soap to wash hands, conical flask, glass tubes, Bunsen burner, conical flask, thongs, gauze
	6-7	4	Metals and Non-metals	Sodium, magnesium, iron, copper, zinc, lead, tin, Bunsen burner thongs, watch glass, hydrochloric acid, safety glasses, gloves, thongs
12	7-8	1	Masses, Moles and Concentrations	Balance, silver nitrate, potassium iodide, copper sulfate, potassium hydroxide, filter paper, spatula, beaker, safety glasses, gloves
	4-5		Acids, Bases and Salts	Hydrochloric acid, sulfuric acid, nitric acid, burette, pH meter, conductivity meter, ammeter phenolphthalein, methyl orange, litmus, safety glasses. beaker, test tubes, safety glasses, conical flask
	5-6	2	Electrochemistry	Power pack, dry cell, connecting wires, Hofmann Voltmeter, carbon electrodes, copper rod, zinc rod, iron rod, hydrochloric acid, copper sulfate, zinc sulfate.
	6-7		Carbon Compounds	Models, plasticine or clay to make models of carbon compounds, safety boots safety helmets, safety glasses, hand lenses for field trips
	9-10	3	Natural Resources and Chemical industries in Papua New Guinea	Coconut, cooking oil, sodium hydroxide, lemon grass, rose wood oil, beaker, measuring cylinder
	5	4	Revising Examinations.	Not applicable.

Design and Technology requirements

Students may choose up to two Design and Technology subjects to study. If students study two subjects, each subject must be studied for 240-250 minutes per week. The subjects are: Design and Technology, Practical Skills Technologies, Food Technology and Textile Technology.

If students study two Design and Technology subjects, teachers must make sure that students do not study the same unit twice.

Design and Technology

The Upper Secondary Design and Technology subjects and Practical Skills Technologies can accommodate many technologies. Schools choose those units that are appropriate for their locality, available expertise and resources.

Practical Skills Technologies

The focus of Practical Skills Technologies is on designing and making a product, using any of the technologies except food and textiles. Typical practical technology projects include working with wood, metal projects, building and construction and small engines. However, there are many other options available to be chosen, depending on the students' interests and school's resources.

Food Technology

The focus of Food Technology is on nutrition and the preparation and serving of food in the home and in the business environment. Typical Food Technology projects include learning about types of food, their properties and functions, and preparing a variety of foods for different purposes.

Textiles Technology

The focus of Textiles Technology is on fibers and fabrics, designing and making products using textiles.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Introduction to Design and Technology <ul style="list-style-type: none"> Occupational health and safety Foundations of technology Technology resources The design process 	Refer to subject area
	10	2	11.2 Design and Technology unit <ul style="list-style-type: none"> Design and Technology project (or any Practical Skills Technologies unit or Food Technology unit or Textiles Technology unit)	Refer to subject area
	10	3	11.3 Design and Technology unit <ul style="list-style-type: none"> Design and Technology project (or any Practical Skills Technology unit, or Food Technology unit or Textiles Technology unit or TVET Certificate 1 module)	Refer to subject area
	10	4	11.4 Design and Technology unit <ul style="list-style-type: none"> Design and Technology project (or any Practical Skills Technologies unit or Food Technology unit or Textiles Technology unit)	Refer to subject area
12	10	1	12.1 Design and Technology unit <ul style="list-style-type: none"> Design and Technology project (or any Practical Skills Technologies unit or Food Technology unit or Textiles Technology unit)	Refer to subject area
	10	2	12.2 Design and Technology unit <ul style="list-style-type: none"> Design and Technology project (or any Practical Skills Technologies unit or Food Technology unit or Textiles Technology unit or TVET Certificate 1 module))	Refer to subject area
	10	3	12.3 Design and Technology unit <ul style="list-style-type: none"> Design and Technology project (or any Practical Skills Technologies unit or Food Technology unit or Textiles Technology unit or TVET Certificate 1 module)	Refer to subject area

Economics requirements

Economics has five units which students must complete. There are three units in Grade 11 and two units in Grade 12.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Introduction to Economics and the Economic Problem	Unit 1 booklet: <i>The Economic Problem</i>
	10	2	11.2 Growing the Economy	Unit 2 booklet: <i>Production</i> Unit 3 booklet: The Role of the Government in the Economy.
	20	3	11.3 Managing the Economy: A Microeconomic Focus	<i>Economics for Developing Nations</i> , Books 1 and 2 <i>Fundamentals of Economics</i> , 1st and 2nd editions
12	20	1	12.1 Managing the Economy: A Macroeconomic Focus	<i>Economics for Developing Nations</i> , Books 1 and 2 <i>Fundamentals of Economics</i> , 1st and 2nd editions <i>Foundations of Economics</i>
	20	3	12.2 The Global Economy	<i>Economics for Developing Nations</i> , Books 1 and 2 <i>Fundamentals of Economics</i> , 1st and 2nd editions <i>Foundations of Economics</i>

General Mathematics requirements

This is one of the required Mathematics option. It is an option for students who are not gifted in Mathematics. It is to be programmed for 240-250 minutes per week.

There are five units each in Grades 11 and 12 which all students must complete. Assessment components, weightings and tasks are in the syllabus.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Number and Application	Bathroom scale, measuring instruments (analogue/digital), mass sets, meter ruler, conversion tables, grid papers
	8	2	11.2 Managing money 1	Scientific calculator, newspaper cuttings (foreign exchange rates), taxation tables, formula sheet
	6	2/3	11.3 Statistics 1	Provide data from Local Level Govt. (LLG), Aviation, Statistics HIV/AIDS, Hospitals or urban or rural clinics.
	8	3/4	11.4 Geometry	Protractor, compass, set square, pencils, rope & paper if no compass, Global map, geo-blocks, 3D blocks
	8	4	11.5 Trigonometry	Clinometer, compass, meter ruler, trundle wheel, compass bearings
12	6	1	12.1 Measurement	Compass bearing, trundle wheel, tape measure, compass, survey field book, resource personnel - surveyors, civil engineers,
	8	1/2	12.2 Managing money 2	Resource personnel e.g. bankers, accountants, stock analysts, underwriters, valuers
	6	2	12.3 Probability and Statistics	Dominoes, deck of cards, marbles, dice, coins, chocolate board, dart board
	6	3	12.4 Algebra and graphs	Grid papers,
	4	3	12.5 Applying Geometry in PNG Arts	Resource personnel, parents, guardians, village elders, traditional artefacts (e.g. billum, tapa cloth)

Geography requirements

There are four units in *Grade 11*, which all students must complete. There are three units in *Grade 12*, which all students must complete. There are also two assessment tasks, which must be completed by students.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 The Structure of the Earth	Maps, globe, blank maps, charts, atlases, textbooks, models, computer software if available, documentaries
	10	2	11.2 Natural Processes and Disasters	Maps, globe, blank maps, charts, atlases, textbooks, models, computer software if available, documentaries
	10	3	11.3 Oceanography	Maps, globe, blank maps, charts, atlases, textbooks, models, computer software if available, documentaries
	10	4	11.4 Population Studies	Population Reference Bureau data sheet, maps, globe, blank maps, charts, atlases, textbooks, models, computer software if available, audiovisual, documentaries, newspapers, printed material such as journals
12	10	1	12.1 Resource Use and Management	Population Reference Bureau data sheet, maps, globe, blank maps, charts, atlases, textbooks, models, computer software if available, audiovisual, documentaries, newspapers, printed material such as journals
	10	2	12.2 Urbanisation and Industrialisation	Population Reference Bureau data sheet, maps, globe, blank maps, charts, atlases, textbooks, models, computer software if available, audiovisual, documentaries, newspapers, printed material such as journals
	10	3	12.3 Comparative Case Studies	Population Reference Bureau data sheet, maps, globe, blank maps, charts, atlases, textbooks, models, computer software if available, audiovisual, documentaries, newspapers, printed material such as journals

Geography takes into account the relevance of the course to Papua New Guinea.

One new topic that has been introduced is 'Oceanography'. This topic deals with one major resource we have. Students must be made aware of our standing in the world in regard to its use and how we can best manage it.

When we understand the make up of our country, take into account factors that affect the majority of our people and love this nation we call home we can then make decisions that benefit all.

Geology requirements

There are eight units, which all students must complete: four in *Grade 11* and four in *Grade 12*.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	9–10	1	11.1 Introduction to Geology	Models, rock samples, classification charts, geological maps
	9–10	1, 2	11.2 Fossils and Geological Age	Models, fossil samples, geological timeline, pictures, slides, film strips
	9–10	2, 3	11.3 The Dynamic Nature of The Earth	Models, posters
	9–10	3, 4	11.4 Continental Drift and Plate Tectonics	Models, charts, maps, rock samples
12	9–10	1	12.1 Volcanism and Earthquakes	Models, charts, maps, VCD, DVD, slides, seismogram
	9–10	2	12.2 Earth's Resources	Sample policy documents, charts, samples of economic minerals
	11-12	3	12.3 Exploration and Mining	Sample policy documents, charts, video, slides
	7-8	4	12.4 Environmental Monitoring and Management	Sample policy documents

History requirements

There are four units in *Grade 11*, which all students must complete. There are three units in *Grade 12*, which all students must complete. There are also two assessment tasks that must be completed by students.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Papua New Guinea's Early History	Evidence from artefacts, museums, local people, stories, war relics, cultural sites, videos or films or CDs, textbooks
	10	2	11.2 Imperialism	Maps, atlases, blank maps, textbooks, stories from old people, colonial sites, guest speakers from formal colonial powers
	10	3	11.3 World War I and its Aftermath	Maps, timelines, textbooks, documents, posters, films, photographs, pictures
	10	4	11.4 World War II	Evidence from war relics, stories, museums, textbooks, maps, timelines, excursions, interviews
12	8	1	12.1 Decolonisation and Independence	Textbooks, films, documents, pictures and photographs, novels
	10	2	12.2 Our Changing World	Textbooks, films, documents, pictures and photographs, guest speakers, television documentaries
	3	3	12.3 Papua New Guinea as a Nation	Textbooks, newspapers, documents, films, local people, guest speakers, government such as Parliament, provincial assemblies, pictures and photographs, interviews
	3	4	12.4 Extension Current events	Television documentaries, newspapers, magazines, documents, forums, posters, radio, guest speakers

The history course was developed with the overarching aim to acknowledge the nation's foundation, the path it is taking and its destiny. It takes into account the factors of influence and change and yet having the focus on Papua New Guinean history. References are then made to her relationship within the region and the world.

However, understanding that our history is orally transmitted, it is our aim to have it passed on through the curriculum. Resources within your reach must be fully utilized and where possible to be documented, stored and importantly shared.

ICT and Computer Studies requirements

ICT requirements

All units must be completed by students. Some units are theory topics and will be taught concurrently with the practical topic in each term.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Computer Fundamentals	Used computers (stripped for demonstration), peripheral devices, posters, timeline, slides
			11.2 Advanced Word Processing	Computers, word-processing software, raw data for processing
	10	2	11.3 Computers and Society	Computers, word-processing software, raw data for processing, internet connection, ICT policy document, ergonomic chart, secondary storage devices, anti-virus software, HIV and AIDS posters or brochures
			11.4 Advanced Spreadsheets	Computers, spreadsheet software, raw data for processing, storage devices
	10	3	11.5 Database 1	Computers, database software, raw data for processing, storage devices
	10	4	11.6 Internet 1	Computers, internet browser, storage devices, modem, telephone line, ISP
			11.7 Desktop Publishing	Computers, publishing software, raw data for processing, storage devices, digital or video cameras, scanners, colour printer
12	30	1–3	12.1 Information and Communication Systems	Computers, file or network server, network software, switches (hub), RJ 45 cables, raw data for processing, storage devices
	10	1	12.2 Database 2	Computers, database software, raw data for processing, storage devices
	10	2	12.3 Internet 2	Computers, internet browser, storage devices, modem, telephone line, ISP, raw data for processing, digital or video cameras, scanners,

				colour printer, LCD projector, OHS, audio speakers
	10	3	12.4 Multimedia	Computers, internet browser, storage devices, modem, telephone line, ISP, raw data for processing, digital or video cameras, scanners, colour printer, LCD projector, OHS, audio speakers
	3	4	12.5 Computers and Employment	Computers, word-processing software, raw data for processing

Computer Studies requirements

All units must be completed by students. Some units are theory topics and will be taught concurrently with the practical topic in each term.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Computer Fundamentals	Used computers (stripped for demonstration), peripheral devices, posters, timeline, slides
	10	2	11.2 File and Information Management	Computers, word-processing software, raw data for processing, electronic encyclopaedia, storage devices
	10	2	11.3 Word Processing	Computers, word-processing software, raw data for processing
	10	3	11.4 Computers and Society	Computers, word-processing software, raw data for processing, internet connection, ICT policy document, ergonomic chart, secondary storage devices, anti-virus software, HIV and AIDS posters or brochures
	10	3	11.5 Desktop Publishing	Computers, publishing software, raw data for processing, storage devices, digital or video cameras, scanners, colour printer
	10	4	11.6 The Internet	Computers, internet browser, storage devices, modem, telephone line, ISP, raw data for processing, digital or video cameras, scanners, colour printer, LCD projector, OHS, audio speakers
12	30	1–3	12.1 Information and Communication Systems	Computers, file or network server, network software, switches (hub), RJ 45 cables, raw data for processing, storage devices
	10	1	12.2 Multimedia	Computers, internet browser, storage devices, modem, telephone

				line, ISP, raw data for processing, digital or video cameras, scanners, colour printer, LCD projector, OHS, audio speakers
	10	2	12.3 Spreadsheets	Computers, spreadsheet software, raw data for processing, storage devices
	10	3	12.4 Databases	Computers, database software, raw data for processing, storage devices
	3	4	12.5 Computers and Employment	Computers, word-processing software, raw data for processing

Language and Literature requirements

There are four units in *Grade 11*, which all students must complete. There are three units in *Grade 12*, which all students must complete. There are also assessment tasks.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	1–10	1	11.1 Journeys and Quests: Part 1	Library or internet references Novel Short story
	11–20	2	11.2 Journeys and Quests: Part 2	Drama Film or singing
	21–30	3	11.3 Cultural Contexts: Part 1	Library or internet references Documentary Novel
	31–40	4	11.4 Cultural Contexts: Part 2	Drama Film or singing Poetry
12	1–10	1	12.1 Life Stories: Part 1	Library or internet references Autobiographical documentary ('biodoc') Biography
	11–20	2	12.2 Life Stories: Part 2	Biographical drama Autobiography Biographical film ('biopic')
	21–30	3	12.3 Writers' Workshop	Speech scripts Sermon scripts Newspaper articles, editorials, letters Government or NGO reports

Legal Studies requirements

There are five units in Grade 11 and five units in Grade 12, which all students must complete. There are also assessment tasks.

Grade	Weeks	Term	Units	Essential resources for activities and assessment
11	5	1	11.1 What is Law?	The Constitution of Papua New Guinea Introduction to Law Pacific Islands Legal Information Institute www.paclii.org <i>A Law Awareness for Papua New Guinea: Our guide to the rule of law</i>
	5	1	11.2 The Legal History of Papua New Guinea	Papua New Guinea colonial history Pacific Islands Legal Information Institute www.paclii.org <i>A Law Awareness for Papua New Guinea: Our guide to the rule of law</i>
	10	2	11.3 The Laws of Papua New Guinea	Pacific Islands Legal Information Institute www.paclii.org The Constitution of Papua New Guinea <i>A Law Awareness for Papua New Guinea: Our guide to the rule of law</i>
	10	3	11.4 The Constitution of Papua New Guinea	The Constitution of Papua New Guinea Teaching material for Introduction to Law <i>A Law Awareness for Papua New Guinea: Our guide to the rule of law</i>
	10	4	11.5 The Structure of Government	Pacific Islands Legal Information Institute www.paclii.org Teaching material for Introduction to Law <i>A Law Awareness for Papua New Guinea: Our guide to the rule of law</i>
12	5	1	12.1 The Courts of Papua New Guinea	The Constitution of Papua New Guinea Teaching material for Introduction to Law <i>A Law Awareness for Papua New Guinea: Our guide to the rule of law</i>
	5	1	12.2 Protection of the Law	HAMP Act <i>A Law Awareness for Papua New Guinea: Our guide to the rule of law</i> The Constitution of Papua New Guinea
	10	2	12.3 Natural Resources and the Law	The Constitution of Papua New Guinea <i>A Law Awareness for Papua New Guinea: Our guide to the rule of law</i>
	10	3	12.4 The Law and You	Pacific Islands Legal Information Institute www.paclii.org The Constitution of Papua New Guinea <i>A Law Awareness for Papua New Guinea: Our guide to the rule of law</i>
	4	4	12.5 Current Issues	Pacific Islands Legal Information Institute www.paclii.org Teaching material for Introduction to Law

Music requirements

There are five units in Grade 11 and four units in Grade 12, which all students must complete. There are also sample assessment task in the teacher guide.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Ear Training I <ul style="list-style-type: none"> • Rhythm studies • Melody studies 	Theory notes, worksheets, musical instruments, assignments, performance, portfolio, local knowledge
	10	2	11.2 Instrument Studies 1 <ul style="list-style-type: none"> • Western musical instruments • Indigenous musical instruments 	Theory notes, worksheets musical instruments and equipment (PA system), solo or ensemble performance, tutorial, musical textbooks
	10	3	11.3 Papua New Guinean Music Studies 1 <ul style="list-style-type: none"> • Traditional music studies • Religious music studies • Traditional contemporary music 	Theory notes, worksheets, musical instruments, assignments, performance, portfolio, local knowledge, resource books
	5	4	11.4 World Music Styles <ul style="list-style-type: none"> • Classical music • Jazz music • Blues music • Country music • Popular music • Indigenous music • Folk music 	Theory notes, worksheets, musical instruments, assignments, performance, portfolio, local knowledge, resource books
	5	1	11.5 Commercial Music <ul style="list-style-type: none"> • Copyright law • Intellectual property rights • Music businesses 	Theory notes, worksheets, musical instruments, assignments, performance, portfolio, local knowledge
12	10	1	12.1 Ear Training 2 <ul style="list-style-type: none"> • Rhythm studies • Melody studies 	Theory notes, worksheets, musical instruments and equipment (PA systems, recorders (analogue and digital), IT accessories, computer hardware and software, audio and video accessories), assignments, performance, practical application
	10	2	12.2 Instrument Studies 2 <ul style="list-style-type: none"> • Western musical instruments • Other musical instruments 	Theory notes, worksheets, musical instruments and equipment
	10	3	12.3 Music Technology <ul style="list-style-type: none"> • Sound production techniques and principles • Basic mixing principles 	Theory notes, worksheets, musical instruments and equipment (PA systems, recorders (analogue and digital), IT accessories, computer hardware and software, audio and video accessories), assignments, performance, practical application
	10	4	12.4 Papua New Guinean Music Studies 2 <ul style="list-style-type: none"> • String-band music • Pawa-band music • Oom-Cha music • Contemporary music 	Theory notes, worksheets, musical instruments, assignments, performance, portfolio, local knowledge, resource books

Personal Development requirements

There are four units in *Grade 11*, which all students must complete. There are three units in *Grade 12*, which all students must complete. Two sample assessment tasks are provided to assist teachers. Teachers are to develop assessment tasks for the units based on the components specified in the syllabus. All assessment tasks must comply with the components in the syllabus.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	I Am a Role Model	Textbooks, models, computer software if available, documentaries, newspapers, magazines, journals
	10	2	My Life, My Future	Textbooks, models, computer software if available, documentaries, newspapers, magazines, journals
	10	3	My Relationships	Textbooks, models, computer software if available, documentaries, newspapers, magazines, journals
	10	4	My Religious Values	Textbooks, models, audiovisual, documentaries, newspapers, printed material such as journals
12	10	1	I Can Make a Difference	Textbooks, models, audiovisual, documentaries, newspapers, printed material such as journals
	10	2	I Want a Healthy, Happy Family	Textbooks, models, audiovisual, documentaries, newspapers, printed material such as journals
	10	3	I Think, Therefore I Am	Textbooks, models, audiovisual, documentaries, newspapers, printed material such as journals

Physical Education requirements

There are three units in *Grade 11*, which all students must complete. There are three units in *Grade 12*, which all students must complete. There are also assessment tasks.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	1–14	1	Moving Body in Action	On Your Marks Anatomical models School-based manuals
	15–25	2	Health and Care in Physical Activity	On Your Marks
	26–40	3	Administration in Sports and Physical Activity	Sport personnel (administrators) Sports administration manuals
12	1–10	1	Analysis of Physical Activity	Clubs or associations On Your Marks
	11–20	2	Socio-psychological Elements of Physical Activity	Physical Education for Melanesia
	21–30	3	Recreation, Leisure and Careers in Physical Activity	Outdoor education texts Leisure industry personnel Internet

Physics requirements

There are six units in *Grade 11* and five units in *Grade 12*, which all students must complete.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	3–4	1	11.1 Measurement	Graduated cylinders, thermometers, balances, metre rules, stopwatches, force meters, vernier calipers, micrometer gauges, regular-shaped objects
	6–7	1–2	11.2 Motion (Kinematics)	Metre rules, stopwatches, ticker timers and tapes, trolleys, linear air tracks, semicircular tracks, ball bearings, carbon papers, tape measures, pendulums
	6–7	2	11.3 Force and Motion (Dynamics)	Metre rules, stop watches, tape measures, balances, pulleys, mass, mass carriers, trolleys, wooden blocks, ropes
	5–6	3	11.4 Work, Power and Energy	Metre rules, balances, force meters, pulleys, mass, levers, pendulum, ropes, model energy converters, wheel and axle
	8–9	3–4	11.5 Electricity Principles	Electroscopes, Perspex rulers, electroscopes and ebonite and glass rods, silk and fur materials, pieces of paper, ammeters, voltmeters, galvanometers, ohmmeters, dry cells, light bulbs, resistors, dry cell holders, press key switches, resistance boxes, Wheatstone bridges (slide wire form or resistor form), potentiometers (slide wire type), resistance wires (nichrome) of different diameters and lengths, metre rules, copper wire leads
	5–6	4	11.6 Electronics	Breadboards, 2-inputs and 4-inputs logic gates (AND, OR, NOT, NAND, XOR) and their specifications including pin layout diagrams, 5–10 V power supply sources or dry cell batteries, dry cell battery holders, single strand wires (2 mm diameter) for connections on the breadboards, light-emitting diodes (LEDs), NPN and PNP transistors (common-emitter, common-base, common collector) diodes, cathode ray oscilloscopes
12	5–6	1	12.1 Fluids	Solid objects (regular and irregular shapes), liquids (oil, water, alcohol), graduated cylinders, balances, hydraulic jack, hose, thin light ring of 1 centimetre diameter, spring balances, cotton threads
	6–7	1–2	12.2 Temperature and Heat	Thermometers, calorimeters, heaters, beakers, blocks of ice; solid metals of regular shapes
	6–7	2	12.3 Waves	Ripple tanks, ropes, springs, glass and Perspex prisms, ray box kits
	7–8	3	12.4 Electromagnetism	Permanent magnets, copper wires, iron filings, compasses, power supplies, soft iron core
	5–6	3–4	12.5 Radioactivity and Nuclear Energy	Radioactive decay data, electroscopes and ebonite and glass rods, silk and fur materials, alpha radioactive source, paper, metal foil, radioactive source (lead) container

Theatre Arts requirements

There are four units in Grade 11 and three units in Grade 12, which all students must complete. There are also assessment tasks which must be completed by students.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Creative Drama	Rehearsal space, costumes, make-up and accessories, props, performance space
	10	2	11.2 Creative Dance	Cassette tapes, musical instruments (tradition or modern), rehearsal space, costume and make-up, performance space
	10	3	11.3 Creative Writing for Dance and Drama	Writing stationeries, story collection
	10	4	11.4 Producing Theatre	Rehearsal space, costumes, make-up and accessories, props, set construction, publicity, front of house, performance space
12	10	1	12.1 Theatre Styles and Practices	Community festivals, theatre productions, library reading materials
	10	2	12.2 Development of Theatre	Library reading materials, community resource people
	10	3	12.3 Awareness Theatre	Community theatre groups, research work, rehearsals, performance space

Tourism Studies requirements

There are four units in *Grade 11* and three units in *Grade 12*, which all students must complete. Students may choose to study a TVET module from the Certificate 3 course in *Tour Guiding* instead of two *Grade 12* units.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	10	1	11.1 Introduction to the Tourism Industry	Maps, blank maps, charts, atlases, textbooks, models, computer software if available, documentaries, DVDs, brochures, advertising material
	10	2	11.2 Tourism in Papua New Guinea	Maps, blank maps, charts, atlases, textbooks, computer software if available, documentaries, DVDs, brochures, advertising material, guest speakers, newspapers
	10	3	11.3 Our Neighbours and Tourism	Maps, blank maps, charts, atlases, textbooks, computer software if available, documentaries, DVDs, brochures, television programs, advertising material, guest speakers, newspapers
	10	4	11.4 Tourism Information	Maps, blank maps, charts, atlases, textbooks, computer software if available, documentaries, DVDs, brochures, television programs, advertising material, guest speakers, newspapers
12	10	1	12.1 Global Tourism	Population Reference Bureau data sheet, maps, blank maps, charts, atlases, textbooks, computer software if available, documentaries, DVDs, brochures, television programs, advertising material, guest speakers, newspapers
	10	2	12.2 Tourism as a Business	Maps, charts, atlases, textbooks, computer software if available, documentaries, DVDs, brochures, television programs, advertising material, guest speakers, newspapers, business forms, travel agency brochures
	10	3	12.3 Customer Service	Textbooks, computer software if available, documentaries, DVDs, brochures, television programs, advertising material, guest speakers, newspapers
	10	4	12.4 Option: Tour Guiding	

Visual Arts requirements

There are four units in *Grade 11* and five units in *Grade 12*, which all students must complete.

Grade	Weeks	Term	Unit	Essential resources for activities and assessment
11	5	1	11.1 Introduction to the Art Room	Examples of classroom rules, materials and equipment demonstration and handling, health and safety guide samples
	6	1	11.2 Art Appreciation	Papers, pen, writing pad, handouts, textbook, visual aid
	10	2	11.3 Principles and Elements of Design	Papers, pencils, brush, water colour paints, water container, pencil colour, Visual aid
	10	3–4	11.4 Figurative Art	Papers, pencil, set up objects, eraser, visual aid
12	10	1	12.1 Painting	Paper, brush, pencil, eraser ,space canvas
	10	1–2	12.2 Visual Communication in Context	Papers, pencils, brush, water colour paints, water container, pencil colour, visual aid
	10	3	12.3 Designing to a Brief	Papers, pencils, brush, water colour paints, water container, pencil colour, visual aid
	10	4	12.4 Managing a Small Art Project	Mounting tape, hard paper, glue
	4	4	12.5 Framing and Presentation	Cutting blade, cutting mat ruler, exhibition area

Staffing new and existing subjects

The new curriculum has three required subjects (an English, a Mathematics and Personal Development or Religious Education).

Staffing new subjects such as Personal Development, Legal Studies, Tourism Studies and others will be a problem in schools for a number of years until enough new graduates come through the system or Lahara/short courses offered by the teacher education providers.

Schools may have too many teachers trained or specialised in a particular subject and not enough teachers for other subjects such as Arts, Business Studies, Design and Technology and History. In order to staff the full range of subjects it is recommended that an audit be conducted of the existing staff in each school to ascertain teachers' training, second or minor subject, past experience, interests, hobbies and skills. Teachers can then volunteer or be requested to take on a subject outside their current practice.

Teachers taking on new roles can be supported through

- training by and assistance from an experienced teacher of the subject
- team teaching particular units within the new subject
- only being assigned one or two classes in the new subject and still having at least one class in their area of expertise
- assistance from community members/volunteers with special skills eg music, carving
- opportunities to share planning and teaching ideas with colleagues from nearby schools.

It is essential that Principals/**BOGs**/GCs liaise with provincial and national education officials to recruit and appoint teachers based on specific school needs. **BOGs** may also be able to advertise and secure temporary teaching positions to cater for the shortfall in staffing.

Choices and options

The reform curriculum involves two levels of choice for schools and/or students.

1. School choices

School administrators and the community must study the requirements of the subjects (staff, facilities and resources) and decide how many of the optional subjects fields or subjects within the fields, can be realistically offered by the school.

2. Student choices

Students must select three other optional subjects best suited to their skills and needs from the range offered by the school. Students should be assisted in their choices with detailed subject/course information provided by the school; realistic advice from counsellors; teachers and parents based on their strengths and weaknesses; and results from the scholastic aptitude test (if available).

Meeting agency requirements

The reform curriculum has been designed to meet the requirements of agency schools, especially in terms of teaching Religious Education. The curriculum provides for two periods a week for Religious Education.

Catering for the needs of all students

Students in any school have a range of abilities, interests and skills and teachers must make every effort to cater for the learning needs of all students: girls and boys; gifted students; slow learners; and students with disabilities. This can be done by making use of different groupings in the classroom and providing a variety of activities.

All subjects in the reform curriculum are available for both girls and boys.

Timetabling

Most subjects are to be timetabled for (5-6 periods) per week or equivalent (240-250 minutes) except for Personal Development and Religious Education with two periods per week (80-100 minutes) and Advanced Mathematics for (8-10 periods) per week with 400 minutes.

It is recommended that English, Mathematics and Personal Development be taught through the week and that all subjects be allocated at least **one double period** per week to allow time for the completion of major activities.

In planning the timetable consideration should be given to the possibility of team teaching, for example timetabling two or more classes in the same subject together to enable greater utilisation of the expertise of different teachers.

The timetable should be constantly reviewed to suit the school size in terms of student enrolment and student/teacher ratios.

There are many different approaches to timetabling. The following are examples of Grade 11 and 12 school timetables.

Humanities focus – 40 minutes period				
Monday	Tuesday	Wednesday	Thursday	Friday
Assembly		Assembly		Assembly
Applied English	Geography	History	General Maths	History
General Maths	Applied English		History	History
General Maths	History	Applied English	Applied English	
	General Maths	Economics	Applied English	Geography
History	Economics	Geography		Economics
	General Maths	Personal Dev	Geography	Economics
Geography		General Maths	Geography	Applied English
Economics	Personal Dev		Economics	

This student will have a total of 1280 minutes/week out of the total of 1600 minutes/week. The school can decide to utilise the non-contact period for other subjects or add more periods to weak areas or for other school developed units

Science focus – 50 minutes				
Monday	Tuesday	Wednesday	Thursday	Friday
Assembly		Assembly		Assembly
L & L	Applied Science	L & L	Advanced Maths	Personal Dev
Chemistry	Advanced Maths	L & L	Advanced Maths	Applied Science
Chemistry	Personal Dev	Chemistry		Chemistry
Advanced Maths	Chemistry	Physics	Personal Dev	Physics
Physics	L & L	Applied Science	Applied Science	Physics
		Advanced Maths	Applied Science	L & L

Business/Technical focus – 50 minutes				
Monday	Tuesday	Wednesday	Thursday	Friday
Assembly		Assembly		Assembly
Applied English	D and Tech	Applied English	General Maths	Personal Dev
Agriculture	General Maths	Applied English	General Maths	
Agriculture	Personal Dev	Agriculture		Agriculture
General Maths	Agriculture	Accounting	Accounting	Accounting
D and Tech	Applied English	D and Tech	D and Tech	Accounting
Accounting		General Maths	D and Tech	Applied English

National High Schools or Secondary Schools using 50 minutes time table can increase the total periods per day from 6 to 7.

Sequencing within subjects

Each subject has different requirements (see subject pages earlier in this section). In some subjects the order of sequence of units is fixed. In other subjects teachers can decide the sequence of some units.

Where there is a scarcity of equipment, space and resources, it is recommended that individual classes follow a different sequence of units.

Section 8: Curriculum Resources

The reform curriculum and outcomes approach requires teachers to use a range of resources to enhance learning opportunities for students.

Current curriculum materials including syllabuses, teacher guides, text books, worksheets should not be discarded. They are still valuable resources.

Schools will have to ensure that:

- appropriate resources are purchased, acquired or developed to support new topics/units or subjects on offer
- additional resources are purchased, acquired or developed to support subjects that have been neglected in the past
- subjects are given an equitable share of the school resource budget
- effective systems are established for the management, security and storage of resources
- the library is resourced and functioning
- facilities such as science and computer laboratories, art rooms, kitchens, workshops are revitalised if necessary, starting with a clean up and basic repairs.

Schools could consider asking parents/students to provide some of their own resources such as dictionaries, tools/materials for Design and Technology subjects or Arts subjects or a calculator for Mathematics.

Budgeting

- The first step in resourcing the new curriculum is to do a comprehensive audit of what is already in the school.
- The list must then be matched with the essential requirements for each of the subjects offered by the school to determine what else is required.
- The third step is to identify priorities and rationalise subject allocations using a collaborative decision-making process.

For the next 2-3 years more funds will need to be allocated to subjects that have been neglected in the past.

Schools should seriously consider using at least 30% of the funding available for curriculum materials/equipment and building up the school library. Heads of departments should use allocated funds early in the year before they are absorbed by other school needs.

Text books

New text books written specifically for the reform curriculum may not be available for several years.

Text books already in schools for most subjects are still appropriate but teachers will have to select the chapter/section/activities applicable for the unit being studied, rather than working systematically through the text book.

Text books for some subjects, such as History, Business Studies and Applied English, may contain some content that is obviously out of date or incorrect. Teachers can supplement these with newspaper/magazine clippings or notes taken from television and/or radio programs and websites. Students are far more responsive to materials that reflect their interests and experiences, or materials that deal with current issues, for example, advertisements for products in today's commercial entities, not something that was advertised ten years ago.

There are many excellent text books on the market but they are very expensive. Teachers should make every attempt to see a sample of any book before ordering to ensure value for money. For example a text book on resource management may only contain one chapter that is relevant to a unit in the curriculum.

Teachers should also consider buying text books that can be used for more than one subject. For example a text book titled 'An integrated approach to Geography' by David Waugh contains information that can be used in Geography, Geology and Agriculture in the Applied Natural Resource Management.

English teachers should maintain a sufficient supply of dictionaries and at least a class set of different text types such as novels and drama scripts.

School developed resources

There are many ways schools can build up a supply of resources without relying exclusively on expensive materials. Examples include:

- working in consultation with the community to collect and use materials found in the environment for subjects such as Theatre Arts, Biology, Design and Technology, and Physical Education
- creating cheaper versions of charts/posters and models by copying from books and other sources. Some of these can be done by students as class activities and then used as resources the following year
- identifying people in the community who are willing to volunteer their time, knowledge and skills to help with projects in subjects such as Music, Integrated Natural Resource Management, Legal Studies, and Tourism Studies

- creating unit resource booklets by collecting and collating material from different text books and other sources
- learning activities planned for students must be beneficial for the school; For example a supply of food crops for the mess from the agriculture project and a mural painting being done by visual art students to decorate the multi-purpose hall.

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Section 9: Planning and Programming

Collaborative planning

The subject teacher guide describes the planning and programming steps for each unit using an outcomes approach. Implementing these steps in schools with more than one class in each grade is best done collaboratively to ensure;

- sharing of ideas, knowledge and skills by both experienced and less experienced teachers
- equitable use of scarce resources
- consistent approaches to assessment and recording
- development of a broader range of student-centred learning activities.

Subject heads and grade coordinators are responsible for ensuring that all NDOE curriculum requirements are met. They must assist subject teachers to interpret the syllabus and teacher guide and develop suitable year and unit programs.

Same subject/grade teachers should meet regularly to:

- plan/design unit programs
- monitor progress in units currently being taught
- develop, implement, mark and moderate assessment tasks
- identify/develop appropriate resources
- evaluate completed units.

Team Teaching

Team teaching involves two or more teachers teaching the same class for the same subject. It is a good way to maximise the specific expertise of teachers and to maximise effective use of resources. It is a valuable approach for modelling, sharing and learning from others, and for making decisions about student progress.

Some subjects lend themselves more easily to a team teaching approach than others. In the new curriculum Theatre Arts is one such subject. The different strands in Theatre Arts (for example Unit 11.3 Creative writing for Dance and Drama) may require a different teacher with Language and Literature knowledge and skills, making it appropriate to teach the same topic/unit to different classes.

Design and Technology and Applied Natural Resource Management also lend themselves to a team teaching approach. For example one Design and Technology teacher may have strengths in Motor Mechanics while another has strengths in Welding. These strengths are best utilised by having the teachers teach appropriate units to different classes at different times of the year. In Agriculture, teachers can team teach when it comes to teaching units on plants, animal husbandry or cash crop.

Integration

Subjects, or units/topics within subject may be integrated, especially in smaller schools. For example managing money in General Mathematics could be integrated with Unit 11.4 Small Business Management in Business Studies.

Integration requires careful planning to ensure that all the learning outcomes of the separate subjects are still met, so not all lessons can be integrated. (Upper primary teachers may be able to assist with planning integrated programs).

Skills development and practical activities

All subjects in the reform curriculum require students to be actively involved in learning. This means teachers must provide opportunities for students to develop and practise skills and apply their learning in a range of activities and situations.

Every lesson must include student-centred activities. Teachers must plan some activities which can be completed in a single lesson and some which may take several lessons and out of class time to complete. This means that unit plans must be flexible and include sufficient time for activities to be completed.

Information about teaching a range of skills for each subject can be found in the teacher guides. The teacher guides also provide suggested student-centred activities in each unit.

Unit activities and projects should be relevant to local needs and make use of local resources and personnel.

Unit activities and projects become more meaningful for students if they are consulted during the planning and development process.

Section 10: Guidance and Counselling

Guidance and counselling services

The guidance and counselling services in the schools must assist students to cope with developmental and career concerns both inside and outside of school.

Generally, the development tasks of adolescence are concerned with the achievement of independence. This means that secondary and National High school students will be concerned with developing skills to help them relate to other people, learning to accept responsibility for themselves and working towards economic self-reliance, whether this be in formal paid employment or in the non-formal sector, all leading to the eventual achievement of independence.

Guidance and counselling programs in schools must help students;

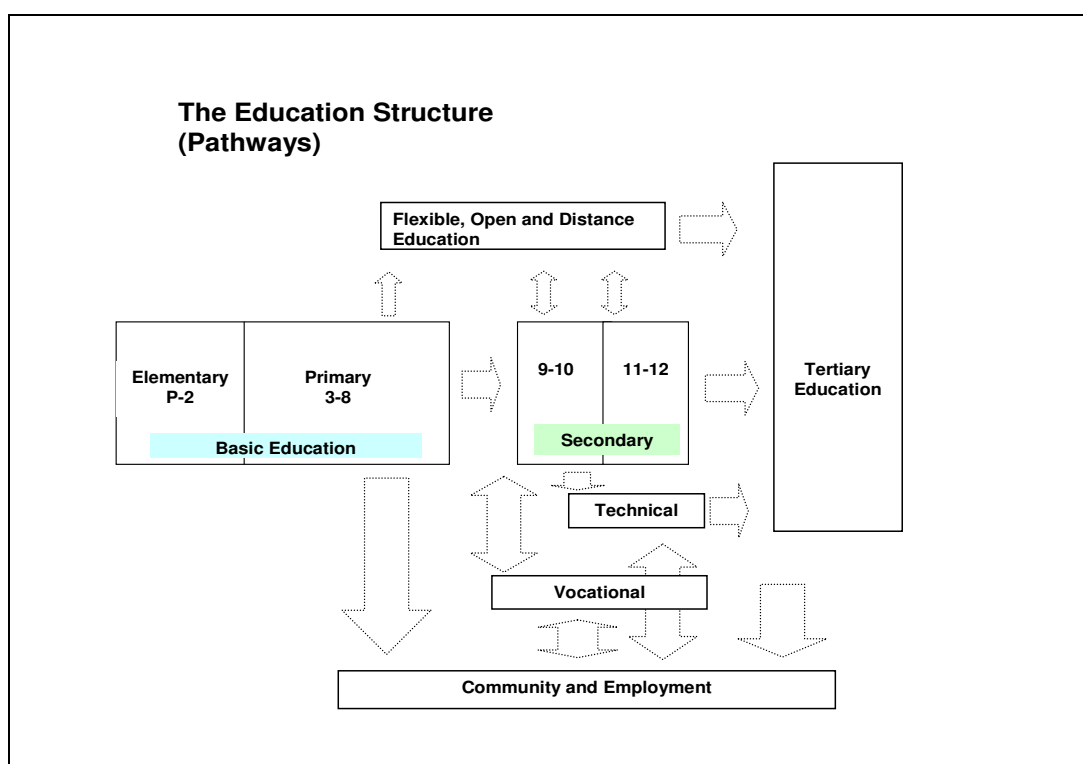
- optimise their capabilities and make educational progress in the school
- make realistic career decisions based on understanding of themselves and their knowledge of the world of work
- resolve concerns about relationships with peers, teachers, family, community and the school.

All students of secondary and National High age experience similar problems about growing up. Guidance and counselling responses to student problems will vary from preventive measures such as lessons on school rules and punishments through to direct support of individuals by way of one to one counselling.

All teachers are responsible for providing timely information and guidance/advice to students/parents, not just guidance officers.

Pathways for students

Students at different levels of education plan their next move with the help of the teachers, parents, school counsellors and guidance officers. Students should be provided with the necessary information and guidelines to assist them make informed choices and decisions about their future. Students can choose subjects from the three pathways: Humanities, Sciences and Business and Technical. They should be provided with information on further education and training, job opportunities in the formal sector and village-based self-employment or non-formal sector options.



HIV/AIDS

The National Education Plan 2005-2014 acknowledges HIV/AIDS as 'one of the greatest challenges to the health and future of the nation.' The HIV/AIDS Policy for the National Education System of Papua New Guinea has been developed in the context of data which estimates close to 70,000 people are currently infected with HIV. The policy lists a number of objectives as its response aimed at reducing the impact of HIV/AIDS at all levels of the national education system. Schools must ensure that:

- students acquire the knowledge and information and develop appropriate life skills to be free of HIV infection all their lives.
- schools are positive learning environments where all infected and affected students can access information, care, counselling and support.

- all members of the school community, including BOGs, are positive and proactive in the prevention of HIV.

The issue of HIV/AIDS is addressed in a number of syllabuses either directly as a topic in a unit or indirectly as the basis for discussion and investigation. Schools can also access the peer educators program.

Schools can utilise the services of the following organisations to conduct proactive awareness in the school and local community:

- National AIDS Council
- Provincial AIDS Council
- Health Department
- Non-Government Organisations working in the health sector, for example, Anglicare.

Schools are the main source of information for the community.

Aptitude Test

Scholastic aptitude testing (including a verbal reasoning test, a non-verbal reasoning test and a numerical reasoning test) is available in Grade 11 and vocational aptitude testing in Grade 11. These scholastic aptitude tests provide information about a student's relative position in the national cohort, and will have some predictive validity for Grade 12 certificate results. By comparing a student's aptitude test results with his or her current classroom performance, under-achievers and potentially gifted students can be identified and provided with appropriate advice/guidance. Students who are working to the best of their ability can also be identified and affirmed.

However to be useful in helping students select appropriate subjects, the test must be administered and scored early in term 1, Grade 11.

Support Services

Support services available to students and parents include:

- access to full time counsellors who provide guidance on educational, vocational, personal and social issues
- guidance teachers and other school personnel
- consultancy and resource assistance such as pastoral care, career education, personal development and study skills programs.

Section 11: Glossary

Assessment	the ongoing process of identifying, gathering and interpreting information about progress from students' demonstration of the intended learning outcomes for their level of schooling.
Assessment criteria:	statements that are used to judge the quality of student performance. They are the conditions set to demonstrate what has been achieved, or the qualities that must be met by performances/ products for work to be deemed successful.
Assessment methods:	major categories into which assessment tasks (and tools) fit. The broadest categories are observation, tests and analysis of products and processes. These broad categories can be further divided into portfolios, performances and oral/verbal responses, products, projects, written responses, examinations, self and peer assessment.
Assessment tasks:	activities the students actually do/complete to be measured or assessed.
Criterion-referenced assessment:	uses a number of indices to produce a profile of the achievement of each student against a set of specified criteria or performance standards.
Curriculum:	The subjects that are included in a course of study or taught in a school.
Formative assessment:	observations which allow one to determine the degree to which students know or are able to do a given learning task, and which identifies the part of the task that the student does not know or is unable to do.
Integration	A strategy that requires teachers to form linkages across subjects.
Learning outcome	a statement that identifies the knowledge, skills, attitudes and values all students should demonstrate at a particular level of education.
Lifelong learning:	a continuous learning process that takes place at all levels - formal, non-formal and informal throughout life.
Local curriculum:	course of study developed to meet local needs.
Norm-referenced assessment:	comparison of one student's performance with the performance of other students. Usually the larger group or "norm group" is a national sample representing a wide and diverse cross-section of students. Students, schools, districts, or even states, are then compared or rank-ordered in relation to the norm group. The purpose of a norm-referenced assessment is usually to sort students and not to measure achievement towards specific goals or standards.

Pathways:	Subject and/or unit and option choices made by schools/students.
Performance standards:	'descriptors' which signify the extent to which the criteria have been met, enabling the teacher to give an appropriate grade. The 'descriptors' provide the key features of performance for each level of achievement.
Reporting	communicating clearly to students, parents and guardians, teachers and others, the information gained from assessing students' learning.
Summative assessment:	Evaluation at the conclusion of a unit or units of instruction or an activity or plan to determine or judge student skills and knowledge or effectiveness of a plan or activity.
Syllabus:	An outline of units/topics covered in a subject, for example Grade 11 Applied English.

Appendix 1: Frequently asked questions

Education Reform

Why have we changed the education system? What was wrong with the old one? Is the reform just another foreign idea?

Before the reform, the Papua New Guinean curriculum was based mainly on foreign Western beliefs and ideas mainly to produce Papua New Guineans to administer the country and achieve academic success. It was recognized that this system needed to change in order to provide a useful education for all citizens of Papua New Guinea. The National Research Institute (NRI) review of the elementary, primary and lower secondary curriculum recommended that a new curriculum was needed that was relevant for PNG and comparable with developments in other countries. Upper secondary review was conducted by University of South Australia in consultation with Tanorama Limited which is a local consultation firm. It was recommended that a new curriculum was needed.

Who will benefit from the reform?

The reform was undertaken to increase access and participation at all levels of education. Enrolments have increased by over 60% since the reform was introduced in 1995.

The education reform redirects the school curriculum towards education for integral human development (IHD) rather than for meeting workforce needs only. The reform curriculum prepares the majority of school leavers (up to 85%) to live in their communities and conduct community-based subsistence and small-scale commercial enterprises, while at the same time supports the other 15% of students who will find paid formal employment or enter tertiary education upon leaving school.

Will the change improve written and spoken English?

The language policy recommends that students begin their schooling using their vernacular language and gradually progress to using English as their main language. Vernacular maintenance is still important in secondary schools. There are no negative effects for students who are bilingual or multilingual. Children who develop proficiency in using their vernacular language to communicate, to gain information, to solve problems, and to think can easily learn to use a second language in similar ways. Overall, continued first-language development is related to superior scholastic achievement. Everything acquired in the first language (academic skills, literacy development, concept formation, subject knowledge, and learning strategies) will transfer to the other language/s. On cognitive and academic measures, children who have lost their first language do not score as well as children who have maintained or expanded their first language as they acquire another language. When the first language continues to be supported, introducing a second language after two-three years of schooling will ensure full

cognitive growth in the first language, which will support full cognitive growth in the second language.

Outcomes approach to education

What is Outcomes Based Education?

"Outcome-Based Education (OBE) means clearly focusing and organizing everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences. This means starting with a clear picture of what is important for students to be able to do, then organizing the curriculum, instruction, and assessment to make sure this learning actually happens." (Spady, 1994:p.1) It is the forerunner of and succeeded in the US by Standards based education reform which is based on similar beliefs.

If it is true that OBE has been rejected in Australia and United States of America, why has it been introduced in PNG?

OBE has not been rejected in Australia, United States of America, Africa and so on. It has been interpreted and implemented in different ways in different states and in other parts of the world. Papua New Guinea has developed its own version of outcomes based education, a version with a focus on what students know and can do at the end of a learning period, rather than a focus on what the teacher intends to teach. Papua New Guinea chose *an outcomes approach* to education reform to improve the standard of learning by teachers having a clear purpose and focus and students knowing what they have to know or be able to do- ie the students have the same clear purpose as the teacher.

What is an outcomes approach?

An outcomes approach identifies the knowledge, skills, attitudes and values that all students should achieve or demonstrate at a particular grade in a particular subject (the learning outcomes).

Learning outcomes provide teachers with a much clearer focus on what students should learn. They also give teachers greater flexibility to decide what is the most appropriate way of achieving the learning outcomes and meeting the needs of their students by developing programs to suit local context and involve the community.

The outcomes approach promotes greater accountability in terms of student achievement because the learning outcomes for each grade are public knowledge - available to teachers, students, parents and the community. It is not the hours of instruction, buildings, equipment or support services that are the most important aspect of the education process but rather, *what students know and can do as they progress through each grade.*

How is PNG implementing an outcomes approach to education?

PNG has defined the learning outcomes for all subjects in the curriculum. These are clearly stated in each syllabus. Knowledge, skills and attitudes and values inherent in the learning outcomes are also described. Planning and programming starts with learning outcomes, then moves to assessment to teaching strategies to resources and so on. Teachers may vary the planning order but consistency between learning outcomes, content, teaching strategies and assessment is essential.

How is the reform curriculum different from the old curriculum?

The old curriculum focused, to a large extent, on remembering facts and figures (content knowledge) some of which were not particularly relevant to PNG. The old curriculum was more teacher-centred. The new curriculum is more student-centred.

Students must be able to do more than simply recall on demand large amounts of information - the simplest of declarative knowledge. Successful learners can apply what they have learnt in new and different situations, and are able to analyse, interpret, evaluate and synthesise information - what we identify as critical thinking skills.

Schools and teachers can now use local and PNG examples to focus on development of understanding, skills and attitudes relevant to PNG. This means that there can be many different learning contexts but only one set of learning outcomes for each grade.

Where else has Outcomes-based Education been practised and been successful?

Nearly all US states and public school districts today have curriculum frameworks, learning outcomes, standards, and goals characteristic of OBE. The main practitioners include Arizona, Washington and Massachusetts. Other countries using OBE include South Africa, Vietnam, New Zealand, United Kingdom and Australia.

What is the difference between objectives and learning outcomes?

Objectives as used in the old curriculum are goals to be achieved and are very broad and loose and are often independently determined by the teacher. Objectives describe intentions and put teachers as central in the education process. Learning outcomes are statements of what is expected of a student. What a student will know and be able to DO as a result of a learning activity. Learning outcomes are clear, observable demonstrations of student learning that occur at or after the end of a significant set of learning experiences. Learning outcomes describe the end points of learning for the student and put students as central in the education process.

What is the difference between the current syllabuses and the new syllabuses?

The new upper secondary syllabuses contain a subject rationale; curriculum principles; subject aims; and learning outcomes to be achieved by the end of Grade 12. Each syllabus contains a number of structured units for Grades 11 and 12. Each unit lists the specific *learning outcomes* for the unit, the *content* that will assist students achieve the learning outcomes and the *assessment* requirements for the unit.

Learning and teaching

Does the new teaching approach mean that teachers do not actually teach knowledge, skills and attitudes?

Some people think that an outcomes approach means that the teacher does not actually “teach” the students any knowledge skills or attitudes. Some people believe wrongly that student centred teaching means that the teacher has less responsibility to teach the students and they will simply learn from each other. The teacher still decides the best ways (including traditional approaches) and the most appropriate content and learning and teaching activities to help students learn and demonstrate their learning, but the teacher also monitors learning and ensures students are directly involved in learning through meaningful activities.

How will classrooms be different?

The classrooms will be different in the following ways. The teacher will act more as a facilitator of learning as well as an imparter of knowledge and the learning will:

- have a clearer purpose
- be more interactive - between teacher and students, between students
- be in the local context more than before
- will be more closely monitored and acted upon by the teacher.

Students will be able to help each other develop skills and attitudes because they are all on the same path, but some students are further ahead so can help those who are behind. Classrooms will have the noise of learning. Learning will often be shared and explanations will use local experience to develop deep concepts and understanding.

Will academically able students be disadvantaged? Will teachers give more time to weaker students?

One of the implications of OBE is that teachers are prompted to think about the individual needs of all students and give opportunities for them to achieve at a variety of levels. Thus, in theory, weaker students are given work within their grasp and exceptionally strong students are extended.

Outcomes based approach calls for students to achieve knowledge and skills at a certain level. If these skills are not achieved, what measures can be taken before they move onto the next level?

An outcome-focused approach accepts that learning progresses along a broadly identifiable developmental continuum. All students can learn and succeed, but not all in the same time or in the same way. Some achieve the learning outcomes sooner and others later. However, most students can achieve high standards if they are given appropriate opportunities. Traditional ways of organising schools do not make it easy for teachers to provide expanded opportunities for all students but now teachers can use student centred strategies such as individual assistance, group work and pairing to help students at least partially achieve the learning outcomes.

What happens if students do not achieve their learning outcomes for the year?

Some students may not achieve all the learning outcomes and will be reported as not meeting the required standards for that particular outcome, but it is likely that most students will achieve most/some learning outcomes. Some students will achieve all learning outcomes. Such information will be important for the student, parents and for the next (grade) teacher to know.

Are students fully aware of syllabus learning outcomes and how they can be assisted to achieve them?

Syllabuses and teacher guides are public documents which students and their parents can access. Learning outcomes charts should be displayed in classrooms and teachers will make clear to students at the beginning of each unit the learning outcomes they will be working towards. Teachers will also provide students with detailed information about assessment requirements, criteria and performance standards.

What does the 'designing down' approach to programming mean?

Planning and programming by designing down means that the starting point for planning, programming and assessing must be the learning outcomes - the desired end results. All decisions on inputs and outputs are then traced back from the learning outcomes. The achievement of the outcome is demonstrated by the skills, knowledge and attitudes gained by the student. The syllabuses and/or teacher guides describe some ways in which students can demonstrate the achievement of learning outcomes.

The learning outcomes are the starting points for programming. Next the teacher thinks about the best ways to monitor the learning that may be occurring (assessment strategies). This is followed by the teacher thinking about the best learning and teaching strategies to facilitate learning. Lastly the teacher thinks about the most appropriate content (K, S, A) to facilitate learning. Then the teacher aligns them for consistency with the learning

outcomes. This is the thinking process that is unique to the 'designing down' approach.

How is this new programming approach different from the old approach?

The old approach was content based, and teacher centred. Some of that content was important but much was not relevant to PNG. The new approach requires all learning outcomes presented in the syllabuses to be taught, across the grade levels. The content is seen as the vehicle for students to learn and demonstrate the learning of outcomes and is not an end in itself.

What happens if a teacher cannot teach all the learning outcomes?

All learning outcomes are mandatory (must be covered). Teachers cannot pick and choose. When a teacher is unable to teach all the learning outcomes students may miss out on the opportunities to learn and demonstrate their learning in that area. Students may also receive poorer internal and external assessment results. Teachers must develop programs that cover all learning outcomes. If a teacher is uncertain about topic content and skills development the teacher must consult with colleagues and/or develop strategies to ensure students do not miss out on essential learning.

What is inclusive education and how can it be supported in schools?

Inclusive education assumes all children are entitled to learn to the best of their ability regardless of gender, intellectual or cultural or economic background. It is best supported by ensuring all children know the purpose and intention of lessons. Inclusive education means not only equal opportunities for learning but also for achieving success

Assessment

How do we assess and record using the new curriculum?

Teachers must use a range of assessment methods (like observation of student performance, concept maps, self and peer assessment, and written tests and examinations that match your teaching methods. For example, in a practical subject, observation would be the most appropriate assessment method, not a written test.

Recording - achievements can occur at various levels such as the unit itself, the strands, sub strands and sub strands within the unit and the learning outcomes within that unit. The more information that is recorded, the better chance students/parents have to understand their weaknesses and strengths.

Will all subjects be nationally/externally examined? How will the external examinations be managed?

There will be a national examination at the end of grade 12 for certain subjects. The external examination provides a measure of student achievement of those aspects of the learning outcomes that can be reliably measured in an

examination setting. Questions for the external examination in subjects will be developed using the learning outcomes, knowledge and skills in the units. Exams won't look the same for all subjects and some may be shorter than others.

The first examination of the new curriculum will take place in 2011.

Will marking be objective or subjective?

Students will be assessed for each unit using formal and informal assessment such as observation of performance, projects, self and peer assessment, portfolios, written tests and examinations. Students will be marked according to the criteria for each task and teachers will judge achievement against performance standards described in the teacher guide. This will make the marking far more objective. Teachers will provide clear instructions for each assessment task and the criteria that will be used so that students know exactly what they have to do. These school based assessment tasks will count towards the final mark for the school certificate.

How much weighting will internal and external assessments have for examinable subjects?

The weightings for internal and external assessment will vary, depending on the nature of the subject. For example subjects with a focus on projects or the making of products will have a higher weighting for internal assessment.

How many subjects are required for selection to universities/technical institutions?

Students must do five (5) subjects. All five subjects are counted towards selection.

How many subjects must a student pass to be given a year 12 certificate?

Students have to complete all the assessment requirements, both internal and external for the five subjects they study during Grades 11 and 12.

Will school based results be moderated?

Yes. They will be statistically moderated against the examination results. The rank order of students within a school will not change however.

How will we know if the reform curriculum is improving the quality of teaching and learning in PNG schools?

This knowledge can be obtained by measuring student performance at regular intervals against expected curriculum standards, written in the reform curriculum. If student performance is seen to rise over time, as the reform curriculum is progressively implemented, this is evidence that the reform curriculum is having a beneficial effect on the quality of teaching and learning.

What is the difference between assessment for learning and assessment of learning?

Assessment *for* learning is assessment that occurs as a regular part of teaching and learning. The information gained from assessment activities is used to improve the teaching and learning process.

Assessment *of* learning is assessment for accountability purposes, to determine a student's level of performance on a specific task or at the conclusion of a unit of teaching and learning. The information gained from this kind of assessment is often used in reporting.

Parents/guardians

How can parents/guardians support their children?

Parents/guardians can support their children by asking, "What was the teacher looking for?" and "why was the teacher looking for this"? The parent is now in exactly the same position as the student in the class and can help their children by asking these questions. When parents ask questions they are conducting their own assessments and can work out where they as parents can help their child. Learning is a partnership and collaboration between parents, children and teachers will improve the learning.

Parents can also support their children by talking to their children and/or the teacher, by looking through work samples or student portfolios. Syllabuses are public documents which parents can acquire or borrow to inform themselves.

How will parents know if their child is learning at school?

In many ways - apart from being happy and wanting to go to school, students who are learning are purposeful learners because they know what is expected of them. Teachers are also more focussed on what is expected of their students. They are likely to be monitoring student progress through observation and other means. They are also likely to be reporting learning in more meaningful ways than before.

Teachers

Will teachers' workloads increase?

There is always more work involved initially when we change the way we do things. Many teachers already use an outcomes approach when teaching because they plan their lessons and units around developing student's skills or understandings rather than covering a content area. Many teachers already use an outcomes approach when teaching because they require students to demonstrate what they know and can do and they provide opportunities for students to demonstrate learning outcomes through active involvement in a range of settings. Many teachers already use an outcomes approach when teaching because they include learning experiences involving higher order

thinking skills such as decision making, problem solving, and interpreting. These teachers will not notice a big difference in their workload.

Will teachers be provided with opportunities for in service or further training?

The types of in-service activities that can be made available to teachers are constrained by funding issues. Face-to-face workshops and in-service activities are very expensive and may not be sustainable in the longer term.

In-service materials have been developed that can be used for school or cluster-based activities. In-service works best at the school level where teachers can practice what they learnt. Principals have an important responsibility in this regard.

There are many resource people in the provinces who can assist with training. These include senior standards officers and others who have been trained as facilitators and assessors.

Will teachers' pay increase?

Teachers' pay will not increase directly as a result of the reform.

Will teachers have the capacity and energy to change?

All change creates feeling of anxiety in the people who have to implement the change. Everyone needs support when they become anxious or worried by the change process. It is important to remember that effective and long lasting change takes time and persistence. Teachers must be encouraged to see that learning new things is exciting and stimulating.

How will better teaching training practices impact on curriculum implementation?

Beginning and practising teachers learn much from observing role models and having opportunities to practise what they are learning. Teacher education programs at the universities are changing to reflect the new focus on student centred learning. Experienced teachers can learn about the new approaches to teaching, learning and assessing from students coming to schools for teaching practice.

Resources

Who is funding the new curriculum materials?

Production and distribution of the new syllabuses, teacher guides and support materials for the elementary, primary and lower secondary curriculum has been largely funded by AusAID through Education Capacity Building Program (ECBP).

Will teachers have sufficient resources, including new textbooks?

Schools will be supplied with print and electronic versions of the new syllabuses, teacher guides, *Implementation Handbook* and support materials.

Text books already in schools for most subjects are still appropriate but teachers will have to select the chapter/section/activities applicable for the unit being studied, rather than working systematically through the text book. Teachers/schools will have to supplement text books with other resources such as newspaper/magazine clippings or notes taken from television programs. Because the new curriculum is student centred, schools will not be able to offer some subjects if the essential resources are not available.

New text books written specifically for the reform curriculum may not be available for several years.

Can PNG sustain the reform curriculum when donor agencies leave?

The biggest cost for the DoE is the printing and distribution of curriculum materials. Because all the new materials have been provided through donor funding, for the next few years the DoE will only have to fund supplies for new schools.

Another major cost is teacher training and in service. By adopting the school/cluster-based model of in service recommended in the *2007-2014 National Teacher In service Plan*, the updating of teacher knowledge and skills should be sustainable.

How can schools facilities such as libraries be utilised to support an outcomes approach to education?

Libraries are a collection of resources to assist learning. Skills of using libraries are not an end in itself but a means of accessing a resource (eg, book). Student-centred learning implies greater use of such facilities, if available. Libraries can instil in students the value of texts as a way of providing specific information. Libraries are then an important centre for resource - based learning. Libraries are also important for developing an enjoyment of reading for relaxation as well as research.

How can provincial education authorities be fully engaged with change in the education reform?

Provincial education authorities must be committed to:

- improving the standard of learning in schools in the province;
- monitoring changes and improvement in the province.
- adjusting priorities including funding to improve learning and measure the output in education.

Upper Secondary Curriculum

Why are English, Mathematics and PD compulsory?

These subjects are compulsory because the need to raise national literacy and numeracy standards. Literacy and numeracy skills are necessary to achieve in all other subjects. Personal Development is compulsory because it encourages students to become responsible decision-makers and contributes to their understanding of major social issues.

How many learning outcomes will there be in each syllabus?

Each syllabus contains eight-ten (8-10) learning outcomes which guide learning for both Grades 11 and 12. Units within each syllabus focus on two-four (2-4) of these learning outcomes which focus on more specific knowledge, skills and attitudes leading to the achievement of the learning outcomes of the subject.

What is a strand?

A strand describes a dimension of a subject. It is a broad, organising structure that defines a way of viewing learning in the subject. Strands together determine the scope of the subject. Strands are arbitrary, that is, a focus on different strands can steer a subject in different directions.

Why does the syllabus have units? How long is a unit? Do units have to be taught in a particular order?

Units are a way of clearly organising subject content, activities and assessment to ensure that all schools teach and assess the same things at the same standard. Units generally take between five weeks and one term to complete. Each subject has specific requirements about the order in which units are taught. The units contain the essential learning needed to progress in that subject.

What is enterprise in education?

Enterprise in education is developing and using skills learned through the study of different subjects to be self reliant at a school and/or individual level, for example selling vegetables grown for an Agriculture project or selling furniture made in Practical Skills Technologies.

How will morals, ethics and values be covered?

Ethics, moral and values are covered directly in the required Personal Development syllabus or Religious Education. They are also covered in the learning outcomes of subjects such as Legal Studies and in discussion/writing activities in subjects such as History and Applied English.

Will the subjects and requirements for university entrance be the same as now?

This will change due to more subjects now on offer. Some subjects such as the Arts and Applied Natural Resource Management may use student folios to accept them into university.

How will a school teach Personal Development without trained PD teachers?

There are a number of ways schools can manage this issue. Schools can utilise the skills of PE and Guidance teachers, and train and support other teachers who are interested in teaching PD. Schools can use a team teaching approach. Eventually schools will be able to recruit newly trained teachers with a PD background.

Appendix 2: Resources available in the provinces

1. Secondary Senior standards officers are your first point of contact. These senior standards officers have attended several training workshops and are well placed to provide strategic assistance and/or advice.
2. ECBP Regional In service Support Advisers (RISA's) can assist with the implementation and evaluation of cluster-based in-service activities. They also provide strategic planning support and advice to curriculum change in-service teams in provinces to ensure effective use of resources. To contact your RISA call the ECBP office on 3255455 for details.
3. Three Collegial Curriculum leadership Program in-service units for principals/head teachers and school leaders. These units contain self-paced learning material on a range of pedagogical issues which are also applicable in the secondary situation. Feel free to copy relevant parts and use them for professional development in your schools.
 - Unit 1: Effective School Management
 - Unit 2: Understanding an Outcomes-based Approach to Education
 - Unit 3: Leading and Managing Curriculum Change
4. Website: www.pngcurriculumreform.ac.pg. This website contains all the curriculum and support materials published with the support of the Curriculum Reform Implementation project (CRIP).
5. Some primary/high and secondary schools are already implementing the reform curriculum; other secondary and national high schools may wish to collaborate with them. Teachers and parents from these schools may be able to assist.
6. International schools are another resource. Many have a secondary component. They are already implementing an outcomes-based curriculum. Secondary schools may wish to collaborate with these schools and see outcomes-based education in action.
7. The University of Goroka, Pacific Adventist University and Don Bosco Technical Institute are the providers of secondary teacher education. Some lecturers at the universities are particularly knowledgeable about the outcomes approach, student centred learning and teaching strategies and assessment. Contact the Dean of Education at these institutions for information about pre service, in service and upgrade programs.