

Handbook for the Teaching of Geography



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**Handbook for the Teaching
of
Geography**

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Foreword

In view of the current reform, teaching, learning and assessment need to reflect the evolving needs of a differentiated classroom environment within a lifelong learning framework. This is in line with the philosophy underlying the National Curriculum Framework (NCF) consultation documents that have been launched in May 2011.

The Form 1 and Form 2 curriculum promote ways that support the development of lifelong learning within a framework which is built on the principle of a continuum of learning. The documents serve as a pedagogical tool intended to help teachers meet the different needs of the learners. Apart from this handbook there are two documents for each subject for each form. The first lists the teaching objectives and learning outcomes that need to be covered in a year. A second document which includes teaching and learning examples is intended as additional means of support for teachers as they work with the range of learners in class. The Form 1 and 2 curriculum offer greater autonomy and flexibility to teachers. The learning and teaching process is envisaged to be active, engaging, meaningful and purposeful. Within this process, valuable information will inform further planning and guide the process that will lead to further improvement of learners.

The learning outcomes will now guide the learning and teaching process. This is an output model directly linked to the direction that is being promoted by the national qualifications framework which is directly referenced to the European qualifications framework. All outcomes are directly tied to the revised attainment level descriptors which describe in detail the learning achieved by the individual learner. The attainment level descriptors illustrate the evidence the teacher needs to elicit from a range of activities during the learning process through well thought-out tasks that demonstrate learners' understanding, progress and achievement.

This learner-centred curriculum respects the diversity of learners that we meet in our daily lives as educators and the ways in which they learn. It is built on the belief that all learners can learn. It is our responsibility as educators to provide the contexts and the pedagogical tools to make learning a meaningful process for all learners, to provide learners with experiences that lead them to experience success in their educational journey, supported by the necessary scaffolding and then to challenge them to the next steps and then to the next steps after that as learners grow into self-directed learners within a lifelong learning context.

Professor Grace Grima
Director General
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Preface

The Secondary Curriculum for Form 1 and 2 reflect the aims and philosophy of the recently published draft National Curriculum Framework (2011) which aims at developing learners who are capable of successfully developing their full potential as lifelong learners. The achievement of these aims depends on the following cross-curricular themes for their success: eLearning; Education for Sustainable Development; Intercultural Education; Education for Entrepreneurship and Creativity and Innovation.

The Form 1 and 2 curriculum documents reflect the principle of diversity of student learning needs. They recognize the reality present in society where students have various differences in backgrounds, aptitudes, interests, intellectual abilities, needs, language competence and learning styles. The Form 1 and 2 curriculum documents provide scaffolding to ensure that learners are supported through appropriate teaching and learning approaches whatever their level.

The National Curriculum Framework clearly states that current theories of learning are based on the social constructivist approach where individual learners construct their own meaning and where one needs to move away from teacher centred to learner centred learning. This should lead to students becoming more active learners responsible for their own learning and where the teacher moves away from having a central role to a situation where the learners acquire more responsibility for the learning that takes place.

This new documentation has been written in a style to assist teachers to develop their teaching practices. Successful education relies upon enthusiastic and committed teachers who are willing to contribute to the evolution of increasingly effective schooling processes. I look forward to seeing the quality of education continuing to evolve and that the intentions of the New Curriculum Reforms will become a reality for all our students.

Raymond. J. Camilleri
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1. Introduction

The purpose of the new curriculum has the overall aim to help schools and their teachers to improve the quality of their teaching and to enable students to raise their level of educational attainment. This is a common concern for many countries within the EU and the wider world.

It is being proposed that the traditional concept of having a syllabus that is time tabled is being replaced by the concept of a curriculum that is managed. This requires teachers to be given a unitised syllabus which covers all of the content that can be realistically and effectively taught within each year of schooling. This has led to the writing of a Teaching Objectives Framework.

Each unit to be taught contains much more than syllabus content, it contains pedagogical suggestions for good practice. The unit is not a strait jacket; it is given as an inspiration and catalyst for teachers to develop their own ideas according to their professional understanding and the abilities of the students in their classrooms.

It is presumed that curriculum content is constantly evolving as our society rapidly changes. The new document should be seen as a flexible evolving tool to support the overall aims of education.

There are a number of paradigms that underpin this approach to curriculum.

These are namely:

- That every student is entitled to a quality curriculum that enables him/her to reach the highest level of attainment that they are able to achieve;
- That in order to do this, student centred learning is an important approach to teaching and learning;
- That all students are on a continuum of ability (not failure) and that such a continuum needs to be identified within strands of learning for each subject. For each strand of learning there are ten levels;
- That the concept of diversity means all students (be they 'the gifted' or 'the least able') should be encouraged to work at their optimum level. In this context the term special educational needs is no longer required;
- That the curriculum management paradigm provides an important professional tool which can be practiced at all levels of the schooling process.

Each subject has the following

1. A Teaching Objectives and Learning Outcomes document
2. The aims for each subject.
3. Strand definitions to indicate the focus of teaching throughout a student's school career.
4. Attainment level descriptors that indicate the learning outcomes of student learning at all levels of schooling.

5. A Teaching Objectives Framework that indicates the syllabus to be taught and which accepts that at each level and in every class there will be a variety of student learning outcomes.
6. Approaches to teaching and learning that are specific and differ for each subject.
7. A number of units which have important sections that relate to the above paradigms
8. e learning perspectives

Each Unit has a number of features

- A front page which indicates
 - the code and title of the unit
 - the length of a lesson
 - the number of hours in which it may be taught
 - the key words to be addressed
 - the points to note especially about the subject approach to teaching and learning
 - a statement about resources including references to e learning
- A subsequent set of five pages which indicates;
 - the teaching objectives
 - examples of teaching activities and experiences that a teacher may wish to use or develop.
 - a column which indicates the range of learning outcomes that can be expected as a student response to each teaching objective. These relate to students attaining across the attainment levels five to ten. Subjects which are not taught at Primary School target different levels
- A set of three pages indicate
 - examples of work within the same teaching objectives for students who are working within attainment levels one to four.
- In some units, a final page that
 - indicates aspects of e Learning that is relevant to that unit

2 General Guidelines in using the curriculum documentation

2.1 Who is the curriculum documentation for?

Curriculum documentation is for teachers, heads of schools, education officers and education support staff and audit teams. The curriculum documentation provides information and suggestions for schools when planning a balanced school curriculum in every lesson for every student. The teacher may

- Make use of this handbook to strengthen the development of students with suitable learning experiences.

- Make and prepare relevant teaching materials according to the suggestions from the selected curriculum units and teaching activities in accordance to students' learning needs.
- Adjust and revise curriculum units to support overall curriculum planning.

This curriculum has been written for ALL students.

2.2 The aims of the Geography curriculum

Geography as a discipline enables us to understand the Earth we are living in from a spatial perspective. As a school subject it enables students to explore and understand the relationship between human beings and the Earth through the study of space, place and the environment. Geography makes both a distinctive and a wider contribution to the curriculum. It is an essential component in preparing young people for life in the twenty-first century. As the pace of change quickens, communications get faster and challenges to the environment multiply, a knowledge and understanding of geography is more vital than ever.

Geographical education is indispensable to the development of responsible and active citizens in the present and future world. Geography can be an informing and stimulating subject at all levels in education, and contributes to a lifelong enjoyment and understanding of our world. Learners require global geographical awareness in order to ensure effective cooperation on a broad range of economic, political, cultural and environmental issues in a shrinking world.

Geography addresses the major challenges that the global community is facing. The resolution of major issues facing our world requires the full commitment of people of all generations.

The aims of the curriculum are:

- to develop in young people an interest in and a sense of wonder about the place where they live in, of other places and people; in particular the spatial arrangement of different environments, the processes that shape our world, and how people and environments inter-relate and inter-connect;
- to enable students become informed, responsible and active global citizens by fostering an appreciation of environments, thereby enhancing a sense of responsibility for other people and the long-term sustainability of the planet;
- to prepare students to think and enquire in a geographical way equipping them to discovery, gather, organize, analyse, use and present new geographical knowledge obtained from maps, data, digital technologies and fieldwork in order to make sense of new situations.

2.3 Approach to teaching and learning for Geography

Each subject has its own unique approach to teaching and learning. This approach happens no matter what system of classroom management is implemented. An approach to teaching and the way the students are expected to learn will relate closely to the nature of the subject content. The following text is the approach for teaching and learning in Geography:

Geography stimulates an interest in and a sense of wonder about places. This sense of wonder and the complexity of the world can best be achieved through a range of methodologies requiring an enquiry approach for the investigation of the location, situation, interaction, spatial distribution and differentiation of features. The learning process centres more on students' activities such as group work, than on the passive reception of knowledge and understanding through teacher exposition. Students should be active in the learning process and they acquire knowledge and develop skills through fieldwork and out of class learning, through the use of Information Technology, resources including maps, as well as games, simulations and role play. An enquiry can be based on a single resource such as a map, a photograph, an item from the internet, statistics from which students extract data, ideas, facts and attitudes to answer a geographical question or solve a problem. Such questions can come directly from students through discussion. The use of group work helps to facilitate the active characteristics of much enquiry work.

2.4 The Teaching Objectives Framework for Geography

For each subject there is reference to the Teaching Objectives Framework that is structured to provide a unitized curriculum. The Teaching Objectives Framework identifies the content to be taught in any one year of schooling and in doing so relates to an effective syllabus/course of study that can be taught within the time available. The time available has been worked to within the assumptions that there are twenty seven weeks in a scholastic year and that a unit of work is six hours long comprising of nine, forty minute lessons. It is acknowledged that different schools will have variations on this system but the one presented is the baseline for all schools.

The Framework identifies the units and their titles that are available in any one year throughout the eleven years of schooling in Primary and Secondary education. Each unit has a set of teaching objectives that cover the six hour period that has been allocated. In this way it is possible to identify the content that can be reasonably expected to be taught. This is not a learning outcomes Framework. For each teaching objective there will be a range of learning outcomes according to the diversity of attainment of students within any one classroom.

The Teaching Objectives Framework is the heart of the curriculum.

Teaching Objectives Framework

	Unit Titles	Key Teaching Objectives
Form 5		
Teaching Block 1	The Green Planet	Explore the basic features that make up an ecosystem as well as the characteristics and distribution patterns of the world's major climates and vegetation types.
Teaching Block 2	The Dynamic Earth: Tectonic Hazards	Discover the physical processes that cause these tectonic hazards and explain how earthquakes and volcanoes can endanger people and cause damage to property and the surroundings. Understand the global distribution of tectonic activity and its relationship with plate boundaries.
Teaching Block 3	Going for a Holiday	Show how the development of tourist activities may bring benefits to many countries including Malta, but can also cause problems. Become aware of the care that must be taken to maximize the benefits and minimize the disadvantages.
Form 4		
Teaching Block 1	Managing Rivers and Coastal Areas: a continuous challenge	Explain the weathering and erosion processes involved in coastal and fluvial geomorphology. Examine how coasts and rivers are affected by erosion, transportation and deposition. Discover how rivers and seas are being polluted and the action that must be taken to reduce these problems.
Teaching Block 2	Industry, Resources and the Environment	Investigate the misuse of the environment and the resulting need to conserve, protect and manage resources and damaged environments.
Teaching Block 3	People Everywhere	Recognise that people are not evenly spread over the world; some places are attractive to people and have become crowded while others are less attractive and are sparsely populated. Investigate how migration is an important cause of population change and the positive and negative effects on the host and receiving country.

Form 3		
Teaching Block 1	The Weather Machine	Understand that weather and climate vary from place to place and from time to time due to weather variations that result from different physical and human factors. Understand the processes by which anticyclones and depressions form and how these are shown on weather maps. Investigate why a river system has many characteristic features and is part of the surface component of the water cycle.
Teaching Block 2	A Place to Live	Explore the factors that encourage the location of settlements and influence why some grow much larger than others. Examine how towns grow and develop in patterns and that these very often change over time. Recognize that urban growth has advantages but very often creates problems.
Teaching Block 3	On the Move	Recognize that transport has its own advantages and disadvantages and that these may change as a result of technology and other developments. Recognise that these changes may cause problems as well as benefits, but also that the problems can be addressed by careful planning.
Form 2		
Teaching Block 1	The Restless Mediterranean	Explore the patterns and processes associated with tectonic activity in the Mediterranean.
Teaching Block 2	Water, Water Everywhere	Discover the importance of water and investigate how it is produced and used for various purposes namely domestic use, agricultural and industrial purposes. Appreciate that water is a scarce resource especially in the Mediterranean Region and as a result this needs to be managed in a sustainable way.
Teaching Block 3	Life in the Sahara	Learn about the patterns and processes associated with desert landscapes. Distinguish and locate different kinds of deserts and analyse why living in desert areas is extremely difficult.
Form 1		
Teaching Block 1	Map Detectives	Understand and develop a body of mapwork skills, from the most simple to ones that are fairly complex.

Teaching Block 2	Exploring the Maltese Islands (1)	Locate the position of the Maltese Islands in the middle of the Mediterranean Sea and within Europe. Consider how the country is part of the wider world and understand the general aspects of its physical geography.
Teaching Block 3	Exploring the Maltese Islands (2)	Explore some aspects of the human geography of the Maltese Islands including where people live and work. Understand how natural and human features are located and distributed in the local environment and how and why they relate to each other.
Year 6		
Teaching Block 1	Geography through the news	An exploration of the relationship between human beings and the Earth by associating what we hear on the news with our studies of space, place and the environment.
Teaching Block 2	Around the Mediterranean	An exploration of the Mediterranean Region; reference to the countries gathered on its shores, their capital cities, the main islands found in the region and entrances leading in and out of it.
Teaching Block 3	Disposing of waste	Identifying the major problems connected with waste disposal and suggesting alternatives.
Year 5		
Teaching Block 1	Working with a map of the Maltese Islands	Locating the main settlements on a map of the Maltese Islands. Identifying distinctive features characterizing the main towns and villages of Malta and Gozo.
Teaching Block 2	Investigating a Foreign Country	Identifying similarities and differences between a foreign country and our country. Reference to physical features and human elements characterizing the two countries.
Teaching Block 3	Seasonal Changes	The unit explores how the four different seasons affect our landscapes as well as the activities that we do regularly or occasionally.
Year 4		
Teaching Block 1	Going to the seaside	An understanding of the difference between natural features and those features modified by human activity which students can observe when visiting and surveying seaside resorts.

Teaching Block 2	Going to town	An understanding of the differences found in the main characteristics of rural and urban settlements. Reference to polluted environments.
Teaching Block 3	Tourism and jobs	Understanding the difference between economic activities directly related to tourism (guiding, travel agents) and those jobs that are indirectly related (transport, banks). Exploring ways and means how our town/village can contribute towards improving tourism in Malta.
Year 3		
Teaching Block 1	Going to the countryside	An exploration of the Maltese countryside with reference to the interaction between the physical features and human elements shaping its environment.
Teaching Block 2	Working and Playing in a safe Environment	Using simple survey activities students identify unsafe features in the surrounding environment of the students and propose action.
Teaching Block 3	Embellishing our locality	Identifying ways how students can become actively involved in the conservation of the environment at their school, home and town/village. An exploration of available means of landscape restoration.
Year 2		
Teaching Block 1,2 or 3	Exploring the place where I live	Exploring the public areas and identifying the main physical features of our neighbourhood. Using directional language to guide friends and relatives in finding the main sites. Identifying the human element in our locality and exploring ways how humans control and adapt to their environment. References to land use and employment.
Year 1		
Teaching Block 1,2 or 3	Around our school	Observing the physical features that can be seen in the classroom, at school and in the public areas around the school. An awareness of the human characteristics that can be observed in and around the school. Exploring how the human element can affect the physical one and vice-versa.

Below are Teaching Objectives Frameworks for Levels 3, 2 and 1. At these levels the framework is not year specific. The Frameworks provide a point of teaching reference for students whose chronological age does not match the attainment range for their age.

Teaching Objectives Framework for Level 3	
The Environment - Natural and Human <i>The teacher will teach students to:</i>	Management, Conservation and Sustainability <i>The teacher will teach students to:</i>
<ul style="list-style-type: none"> look out for representational symbols and how to follow simple routes within the school environment. 	<ul style="list-style-type: none"> learn about the misuse of the environment.
<ul style="list-style-type: none"> become familiar with features that make up an island and to identify at least another country near to Malta such as Italy on the map. 	<ul style="list-style-type: none"> consolidate their awareness about the relationship of human activities and environmental care ; cleaning up polluted areas, planting trees.
<ul style="list-style-type: none"> learn about the geography of the Maltese islands and where people live and work. 	<ul style="list-style-type: none"> realise that there is a link between quality of life and the environment ; example drinking dirty water, swimming in polluted sea, noise and smoke pollution by traffic.
<ul style="list-style-type: none"> recognise and make observations about weather elements; such as rain, wind and temperature changes. 	<ul style="list-style-type: none"> learn about quarries and become familiar with the idea that while industry creates jobs yet it also causes pollution in the environment.
<ul style="list-style-type: none"> learn about different environments such as deserts and life in the desert. 	<ul style="list-style-type: none"> identify some features associated with tourism such as hotels, bars, restaurants etc.
<ul style="list-style-type: none"> become familiar with tectonic activities; earthquakes and volcanoes. 	<ul style="list-style-type: none"> realise the consequences of sea pollution; such as dead fish and birds, oil spillage.
Teaching Objectives Framework for Level 2	
The Environment - Natural and Human <i>The teacher will teach students to:</i>	Management, Conservation and Sustainability <i>The teacher will teach students to:</i>
<ul style="list-style-type: none"> follow simple directions when following a route. 	<ul style="list-style-type: none"> sort pictures about different environments and learn about rural, coastal and urban environments.
<ul style="list-style-type: none"> learn why certain places are called islands by looking at aerial views of Filfla, 	<ul style="list-style-type: none"> become aware that people can affect the environment by leaving objects lying about

St Paul's islands, Comino, Gozo and Malta.	for example paper and litter.
<ul style="list-style-type: none"> become familiar with local weather elements . 	<ul style="list-style-type: none"> identify the effects of transport such as noise pollution.
<ul style="list-style-type: none"> learn the difference between a rural and an urban area. 	<ul style="list-style-type: none"> learn where waste is disposed of; landfills.
<ul style="list-style-type: none"> identify the damage caused when the earth moves by showing videos and photos of damage left by earthquakes. 	<ul style="list-style-type: none"> identify the difference between the countryside and industrial areas.
<ul style="list-style-type: none"> learn to identify different environments such as deserts. 	<ul style="list-style-type: none"> learn what causes pollution in the sea.
Teaching Objectives Framework for Level 1	
The Environment - Natural and Human <i>The teacher will teach students to:</i>	Management, Conservation and Sustainability <i>The teacher will teach students to:</i>
<ul style="list-style-type: none"> Encounter people and objects in the environment: development of sensori-motor cognition strands through encountering people and objects found in the immediate environment space and surroundings. Encounter different environments and weather elements in order to experience physical features, such as valleys or the coast as well as to experience elements in the environment such as cold heat and rain. 	<ul style="list-style-type: none"> Encounter people and objects in the environment: development of sensori-motor cognition strands through activities in which they encounter people and objects that are related to visits to various environments such as the countryside and the seaside.
<ul style="list-style-type: none"> Aware of people and objects in the environment: development of sensori-motor cognition strands through activities that aim at enabling the learner to encounter different environments and weather elements in order to consolidate awareness of physical features and elements in the environment such as climate and vegetation. 	<ul style="list-style-type: none"> Aware of people and objects in the environment: development of sensori-motor cognition strands through activities in which they begin to show interest in people, events and objects, <i>e.g. looking around in outdoor environment for example looking at trees or buildings.</i>
<ul style="list-style-type: none"> Respond to people and objects in the environment : development of sensori-motor cognition strands through activities that aim at enabling the 	<ul style="list-style-type: none"> Respond to people and objects in the environment : development of sensori-motor cognition strands through activities in which they accept and engage in coactive

<p>learner to respond to and explore objects found in their immediate environment and space, as well as in the different environments within the school and outside school in order to relate to human and physical features.</p>	<p>exploration, <i>e.g. together with an looking a rubbish dumps or litter left by people in the countryside or at the sea side.</i></p>
<ul style="list-style-type: none"> • Engage with people and objects in the environment : development of sensori-motor cognition strands through activities that aim at enabling the learner to experience the different human and physical features in the environment through sensory activities such as different weather elements, different temperatures of water and tactile experience of sand and various kinds of rocks and vegetation. 	<ul style="list-style-type: none"> • Engage with people and objects in the environment : development of sensori-motor cognition strands through activities together with their peers while on school visits for example visiting a farm or factory; looking at traffic and urban pollution.
<ul style="list-style-type: none"> • Participate in activities of people and objects in the environment: development of sensori-motor cognition strands through activities that aim at developing interaction with the immediate environment space and surroundings as well as the different environments, such as going on school outings and participating in activities such as following a route from a map. 	<ul style="list-style-type: none"> • Participate in activities of people and objects in the environment: development of sensori-motor cognition strands through activities in which the learner cooperates while being supported during school outings, for example riding on a tractor, look at fumes coming out of chimneys in factories.
<ul style="list-style-type: none"> • Involve in activities of people and objects in the environment: development of sensori-motor cognition strands through activities that aim at increasing involvement in tasks such as holding and looking at simple maps, moving over different outdoor surfaces in different directions observing, looking at videos and pictures of earthquakes and volcanoes together with their peers. 	<ul style="list-style-type: none"> • Involve in activities of people and objects in the environment: development of sensori-motor cognition strands through activities that aim at taking more and longer turns with very familiar persons, for example taking part in a traffic count, participating in identifying areas in which waste was left behind by picnickers.

2.5 The value of a unitised curriculum

There is a clear relationship between the volume of content to be taught as projected within a syllabus/course of study and the level of attainment that each student can achieve. The greater the volume of content then less time is available for teaching each aspect of that content. By writing a unitised curriculum the balance between the range of content and the time available for student learning can be achieved. For this new curriculum, in many areas this has meant a reduction in what was being offered in the preceding syllabus. Each unit then has a specific set of objectives which can be reasonably expected to be learned as the allocated time for that unit is made available on the school timetable.

In addition by having a unitised curriculum it is easier for the teacher and the subject Head of Department to manage the curriculum for they are able to quantify the number of specific objectives that it has been possible to deliver and subsequently to make decisions about which units should be presented in which order throughout each year of schooling.

2.6 Strands of learning for Geography

A strand of learning represents a goal that a student can attain throughout Primary and Secondary education. Each subject will have several strands of continuous learning called attainment level descriptors, which begin in Year One of Primary School and end in Form Five of Secondary School. Each strand is defined and the strands for Geography are:

1. The Environment - Natural and Human

This strand is concerned with:

- the landscapes and aspects of the environments which have been formed by natural processes (geomorphology and meteorology)
- the people who live in different environments, their activities and the features which they have created.

These physical and human processes cause change and development in places and can be used to explain patterns and distributions.

2. Management, Conservation and Sustainability

This strand outlines how geography can foster the student's appreciation of different environments and his/her sense of responsibility for their conservation and enhancement. This strand is concerned also with environmental issues ranging from matters of local concerns to global environmental problems encouraging the student to appreciate the need of promoting sustainable development.

2.7 The use of the attainment level descriptors for Geography

There are ten levels of attainment level descriptors. Level Four is equivalent for Year One and two in Primary school and each level then progresses at two yearly intervals.

Each strand of learning has a set of attainment levels which describe the progression in student learning. There are ten attainment level descriptors that cover the full range of attainment of ALL students. The attainment level descriptor Four is indicative of what the average student can learn by the end of Year Two in Primary education. Each subsequent level represents the range of attainment that an average student can be expected to achieve every two year years. Attainment levels one, two and three are indicators for students who may not attain level four at the end of Year Two. Attainment level ten is for those students who significantly exceed the expected level of attainment at Form Five.

The attainment level descriptors are observable statements of learning outcomes that students can attain. There are approximately eight of these statements in each attainment level descriptor. The statements are referred from the Teaching Objectives Framework and indicate a sample of what can be expected to be learned. Once a student has attained the majority of the learning outcome statements in an attainment level descriptor they are assumed to be working within the next level. The attainment level descriptors for Geography are:

Strand 1: The Environment – Natural and Human

This strand is concerned with:

- the landscapes and aspects of the environments which have been formed by natural processes (geomorphology and meteorology)
- the people who live in different environments, their activities and the features which they have created.

These physical and human processes cause change and development in places and can be used to explain patterns and distributions.

Attainment Level 1

Students encounter activities and experiences such as weather elements, rain, cold, etc. Student follows a slow moving object. Student watches hand when it moves. They apply potential solutions systematically to problems, for example, by tipping a container in order to pour out its contents. Student makes sound when distressed. Student shows interest in adults. Student use emerging conventional communication. They vocalize sounds similar to models immediately and imitate at least one invisible gesture. They attempt to activate an object by giving it back to adult. They can remember learned responses over increasing periods of time: e.g. uses a stick to get an object without demonstration.

Attainment Level 2

Students extend their skills to help them explore the world. They become aware of weather conditions. They start to recognize and to make observations about simple weather elements. Students experience the concept of hot and cold through every day items. They associate dressing up for the different weather conditions. Students encounter different environments within the school to consolidate their awareness of human and physical features in their daily surroundings e.g. walking around the school. They start to identify the use of different areas such as yard, office. They follow arrows or a coloured line that indicates a route to locate areas, for example, go to head's office or assembly hall. They consolidate a sense of direction following verbal prompts and hand instruction.

Attainment Level 3

Students observe and start to recognize some weather elements. They experience and identify rain, wind and temperature changes e.g. put up umbrella when using watering can to simulate rain, using a rubber glove filled with cold water and then filled with warm water to indicate temperature difference. Students become aware of the differences between the physical/natural and human/made features of places. They use pictures or symbols to show familiar places and what they are for, e.g. the school, the church. They start to realize that a simple plan can be used to identify the location of, for example the teacher's desk on a simple class plan. Students start to communicate their preferences about the physical/natural and human/made features of places e.g. when asked what they prefer or like, they point to a particular feature example, the sea or public garden. Students recognize the physical/natural and human/made features of places, e.g. start to identify familiar buildings such as their home and school. They start to understand that different buildings have different uses.

Attainment Level 4

Through oral expression and pictures, students recognise some physical features of their locality. They identify and talk about a limited range of places and features in the locality, namely the school, the surrounding area and their neighbourhood. They start using simple directional language such as *up, down, forward, backwards*. Students attempt to describe orally simple picture maps not to scale. They observe and begin to comment about some natural cycles that are evident in everyday life e.g. night (or) day, rainy (or) sunny. They use resources that are given to them to ask and provide simple answers to questions about places around them. They use their own observations to ask and provide simple answers to questions about some places around them.

Attainment Level 5

Students can recognise and suggest some simple descriptions of the common features of the Maltese countryside and of a typical Maltese urban settlement. They begin to observe how physical features give places their character. They use resources that are provided to them like photographs, models, sketches and drawings to answer questions about the Maltese countryside and a few selected urban areas. They carry out simple tasks such as collecting soil samples and stones and observe living things in their habitats. They use this information and their own observation to respond to questions about natural environments. Students can differentiate between jobs directly related to tourism and those

that are indirectly related. They can suggest ways how their locality can contribute towards improving the tourism industry. Students begin to use simple but appropriate geographical vocabulary. They record and communicate experiences and observations using simple drawings, displays, models and sketches.

Attainment Level 6

Students become aware that on a globe one can note a number of continents and oceans. They recognise that continents have different shapes. Students show their developing knowledge of the location and names of urban areas in Malta and capital cities of the neighbouring countries in the Mediterranean. They use globes and maps to become familiar with the location of these towns and cities. They recognise that different places may have both similar and different characteristics that influence the lives and activities of people living there. They are familiar with a few main national symbols characterising some Mediterranean countries, e.g. Colosseum (Rome) and Pyramids (Egypt). Students begin to associate their geographical knowledge with the places mentioned in the news. Using both Internet and other publications they can research about foreign countries, comparing their physical characteristics and their human elements with those of the Maltese Islands. They can observe and record varying weather conditions using appropriate vocabulary and simple equipment in response to tasks set by the teacher. They use skills and sources of evidence to explore how the weather influences the lives of people and how seasonal changes affect people and plants in the locality.

Attainment Level 7

Students show knowledge and understanding of aspects of the geography of Malta and the Mediterranean as part of the wider world by the use of co-ordinates on atlas maps. They demonstrate orally and in writing, through pictures and maps an understanding of the characteristics of a range of physical features and of human activities within these places. They describe how tectonic activity changes the features of places and affects the lives of people living there. They explain the physical processes at work in the formation of landscapes including sedimentary rocks, rock strata, underground water and fossils. They recognize and describe simple climatic and geomorphic patterns and processes associated with desert landscapes and analyse why deserts are difficult environments for human, animal and plant survival. They explore the major features of the built environment by focusing on settlement functions and patterns of some localities in Malta. They use geographical terms to communicate their findings on fishing and tourism in Malta. Students learn about and interpret their location or locality relative to other places through mapping skills including scale, compass points, direction and 4-figure grid reference. They identify features on maps through symbols and keys and use maps at different scales to find their way around and plan journeys. Students use a range of geographical skills including equipment and ICT to observe weather phenomena, display simple weather observations in an organised way using climate graphs and appropriate vocabulary as well as to integrate their understanding of rainfall with the hydrological cycle.

Attainment Level 8

Students use appropriate geographical vocabulary to offer detailed descriptions and explanations of patterns of weather and climate in a European-scale context. They use appropriate sources including ICT to examine satellite images and weather maps to investigate weather patterns. They suggest relevant geographical questions about the causes of floods and how people contribute to their frequency and intensity. Students describe in depth processes of weathering, erosion and deposition in river valleys and coastal areas in relation to studies of a range of places at more than one scale. They recognise some features produced by these processes. Students use a range of geographical skills such as topographical maps with 6-figure grid reference and contour lines, tabulated data and images to help them investigate, recognise and describe geographical patterns and processes related to population distribution and settlement location. They recognise and describe how these processes may lead to similarities and differences between places in more economically developed countries (MEDCs) and less economically developed countries (LEDCs) and in the lives of people living there. Through role play, illustrations and video-clips students explore the characteristics of different forms of transport and by means of case studies analyse how new transport developments increase accessibility. Students present and communicate their findings, ideas and information using appropriate terminology, maps, visual images and a range of graphical techniques and ICT.

Attainment Level 9

Students describe and begin to explain interactions within and between the physical processes which cause earthquakes and volcanoes and how people respond to them. They explain how these interactions create geographical patterns of tectonic activity and help change places and environments in 'active zones'. They research case studies of specific volcanic eruptions and earthquakes to illustrate the devastating effects caused by these hazards and begin to explain why people choose to live in these zones as well as suggest appropriate planning strategies to save lives. They analyse the main factors which affect climate and the main features which constitute an ecosystem. Students explore some examples of the inter-relationship of climate, natural features, flora, fauna and human life in different environments in some main climatic regions of the world. Students construct and use plans and maps and apply map skills accurately to obtain information about volcanoes, earthquakes and ecosystems. They begin to suggest relevant geographical questions, select and use appropriate skills and ways of presenting information to help them make connections. Independently they use primary and secondary sources of evidence such as statistical data, newspaper extracts and brochures to find about global trends in tourism and to realise the importance of tourism on a worldwide scale. They present their findings both graphically using a range of techniques such as sketch maps and graphs and in writing with ample and pro-active use of ICT. They present conclusions that are consistent with the evidence.

Attainment Level 10

Students show and apply knowledge and understanding of a wide range of places, environments and issues at different scales. They explain a wide range of physical and human processes and investigate the interaction within and between these processes. They evaluate sources of evidence including the use of ICT to explore a number of physical and geomorphic processes. They analyse, synthesise and interpret a range of geographical information to investigate the patterns and processes associated with weather, climate and examine natural systems and cycles such as rocks, the development of river valleys, coastal and other landscapes. They describe in detail how these cycles work and how the processes of erosion, transportation and deposition shape the landscape and create new landforms. They also use topographical maps at various scales to identify and recognise the features produced by these physical processes and apply their knowledge to explain relationships and interactions between people and the environment. Students apply a variety of geographical skills and tools such as maps, atlases, statistical data and even problem-solving skills to describe spatial patterns and geographical processes related to global population issues including density, distribution and change (including urbanisation and migration), settlement and industrial location. They work independently to plan their own investigations (e.g. designing questionnaires) and fieldwork activities (observe, measure, extract and record data) and communicate findings, ideas and information in a coherent way using extended geographical terminology.

Strand 2: Management, Conservation and Sustainability

This strand outlines how geography can foster the student's appreciation of different environments and his/her sense of responsibility for their conservation and enhancement. This strand is concerned also with environmental issues ranging from matters of local concerns to global environmental problems encouraging the student to appreciate the need of promoting sustainable development.

Attainment Level 1

Students encounter activities and experiences such as being taken near the sea or in the countryside. Student follows a slow moving object. Student watches hand when it moves. They apply potential solutions systematically to problems, for example, by tipping a container in order to pour out its contents. Student makes sound when distressed. Student shows interest in adults. Student use emerging conventional communication. They vocalize sounds similar to models immediately and imitate at least one invisible gesture. They attempt to activate an object by giving it back to adult. They can remember learned responses over increasing periods of time: e.g. uses a stick to get an object without demonstration.

Attainment Level 2

Students are aware that there are different environments. They sort pictures about different environments. They show preference for different people and environments and will start to answer simple questions, for example, whether a place is clean or dirty. They are aware that people can affect the environment, example by when they leave paper and objects lying about. They sort pictures of environments according to whether they are clean or dirty. They recognize and are aware of the difference between natural (rural) areas and urban areas. They can look at pictures of, for example, Comino and of Valletta and notice the difference. They are also aware of noise pollution.

Attainment Level 3

Students recognize and may make very basic descriptions of some features of the Maltese countryside and coastal areas as well as of the urban environment. They use resources that are provided to them like photographs and drawings to answer questions about the Maltese countryside and a few selected urban areas. They are aware of their role in caring for the environment. They can look up pictures showing people caring for the environment e.g. planting trees. They consolidate their awareness about the relationship of human activities and environment care by looking at pictures and photos of areas that have changed within a few years. They become aware that there is a link between quality of life with causes and consequences of environmental issues, example drinking dirty water or swimming in polluted water make you sick. They associate pictures of consequences of environmental issues such as death of birds and oil spillage disasters in oceans.

Attainment Level 4

Students use a range of secondary sources to recognise how people can bring about changes to the environment. They use first-hand enquiry to identify how people continually try to control and adapt to their environment, in the process affecting the same environment. They express their views on attractive and unattractive features of the environment around them. Students recognise how altering (changing) physical features in a landscape can have pleasant and unpleasant consequences, e.g. when a field is built up. They start becoming aware that we need to make efforts in order to have pleasant environments where we can have a good time and where we can grow up healthily. They suggest how spoilt landscapes in their immediate environment can be improved by simple concrete actions.

Attainment Level 5

Students show their knowledge and understanding of their local environment, namely school, home and their town/village. They show awareness of some difficulties people may encounter when trying to keep environments clean and healthy. Students appreciate the attributes of the local environment through photographs, drawings and out of school visits. They express their views in simple sentences and drawings and offer some reasons why we need to take care of the local area, village and the countryside. Through outings they develop a sense of responsibility for taking care of and enhancing the environment. They use this information and their observations to help them ask and respond to

questions on strategies for making the local area safer and a more pleasant place to live in. Students begin to classify environments as safe or unsafe. They can propose solutions to change 'unsafe' places into 'safe' ones. They propose ways how safe environments can proceed to be embellished. Identify different aspects contributing towards healthy environments of seaside, countryside and town. They use richer geographical vocabulary to lobby for action.

Attainment Level 6

Students recognise that people continually seek to improve and sustain environments. They show their developing knowledge on the causes of and possible solutions to local and national environmental issues related to solid waste management. They begin to account for their own views about the generation of waste and waste disposal and recognise ways in which people try to manage it for the better. Students ask and respond to geographical questions while undertaking tasks set by the teacher to develop a sense of responsibility and their role as environmental wardens (carers). Students suggest ways how distinctive features of the Maltese Archipelago can be retained and conserved, e.g. rubble walls of the Maltese countryside. They recognise that different countries may have both similar and different characteristics that influence the lives and activities of people living there. Students identify common environmental problems we share with one or two Mediterranean countries. Use ICT to learn about environmental problems facing humanity. They identify some impacts that extreme weather can have on the environment. Learn how to apply their geographical knowledge to news items.

Attainment Level 7

Students show their knowledge, understanding and skills in relation to studies of a range of factors that have an adverse effect on the environment. Students carry out practical investigations and by the use of traffic counts, surveys and various other secondary sources, they investigate some ways by which transport affects the environment. Drawing on their knowledge and understanding, they make suggestions as to how traffic problems can be tackled in urban areas. Through debates, role play, discussion and research work students identify some of the causes of over-fishing as well as the benefits and negative effects of aquaculture. They select and begin to evaluate sources to present evidence for their investigation on the deterioration of ground water reserves and suggest plausible solutions for sustainable water management. They show genuine concern and give evidence of their improved lifestyles. Students fully realise why tourists visit Malta. Drawing on this knowledge they suggest relative geographical questions in relation to the positive and negative impact to the economy and environment of the tourist industry in Malta. They offer reasons for their own views about such environmental issues and recognise that other people may hold different views. Students can communicate their findings, ideas and information using appropriate geographical terminology, maps, annotated photographs, diagrams and ICT to develop and present their understanding of such environmental issues.

Attainment Level 8

Students analyse the impacts of quarrying on the natural environment and describe ways in which a disused quarry may be restored. They become aware of the species that are becoming endangered and the causes and consequences of industrial pollution. Students value the importance of the Earth's renewable and non-renewable resources and the urgent need to invest in alternative sources of energy to combat climate change. Students recognise how conflicting demands on different types of

environment may arise and describe and compare different approaches to manage these environments sustainably. They appreciate that different values and attitudes, including their own, result in different approaches, which have different effects on people and places. Students extract information from the internet, illustrations and walkabouts in their own town about urban problems arising out of traffic, pollution, crime, vandalism and waste management. Drawing on their knowledge and understanding they suggest relevant geographical questions and appropriate sequences of investigation of these environmental issues. Through individual research and investigations students make suggestions as to how traffic problems can be tackled in urban areas. They use effectively a range of skills and select a range of sources of information including the internet with confidence to establish evidence for their investigations. They present their findings in a coherent way and reach conclusions that are consistent with the evidence.

Attainment Level 9

Students collect and record information from the web, illustrations, video clips, climatic graphs, maps and other secondary sources about three different world biomes and recognise and understand complex relationships between people and the environment, identifying current problems. Students recognise that the development of the tourist industry can bring benefits to the local people and at the same time may cause adverse environmental effects. Students realise and explain conflicts between different land users in certain attractive areas. They offer informed explanation of the viewpoints of different groups and suggest ways by which conflicts of interest might be resolved, showing awareness of some of the complexities of compromise. Students begin to evaluate existing policies for managing the impact of these environmental issues to ensure sustainability. They identify geographical questions and establish their own effective sequence of investigations into tourism studies. Students use the internet to design brochures and write letters of protest on new tourist developments in attractive areas. Drawing on their knowledge and understanding students plan and compile their own questionnaires on the attractions of the local tourist industry and to identify the problems created by mass tourism. They suggest possible solutions how tourism can be managed sustainably. They use different appropriate statistical, graphical, cartographic and verbal skills to help them present their information, make conclusions and to present their findings in a coherent way.

Attainment Level 10

Students show and apply knowledge and understanding of a wide range of environmental issues at various scales. They explain how places change due to various human activities such as tourism, agriculture and industry, identify trends and describe how different land uses impact the environment. Students investigate environmental issues such as soil erosion, urbanisation, over-fishing, sea and water pollution, and the generation of waste, and recognise how environmental change leads to conflicting views about management and different interpretations of sustainability. They make informed judgements about these issues, develop and reflect on their own views and opinions, evaluate existing policies and finally design policies in order to resolve conflicts and ensure sustainability. Drawing on their knowledge and understanding on sustainable development they plan their own sequence of investigations and suggest relevant questions on how to protect threatened environments and ecosystems. They use appropriate techniques and technologies such as satellite imagery, maps, data and the internet to analyse and interpret evidence on current issues such as climate change and global warming in order to assess bias and the reliability of geographical evidence to weigh arguments, and to make decisions. They carry out independent research and fieldwork activities on environmental issues in the locality and communicate their findings, ideas and information

using extended geographical terminology and tools accurately and appropriately.

2.8 The use of attainment level descriptors for national benefit

Attainment levels of all students should be assessed on an annual basis. This will allow all of the stakeholders to evaluate the progression in learning made by each student. The data collected will give a simple score of the number of the attainment level reached in each strand. This data can then be collated by the school, by the college or by the Department of Curriculum and eLearning to give a general picture of year-on-year progression of attainment. The data base will be used with clearly defined ethical responsibility so that students, classes or schools cannot be identified by other schools or colleges. This data is very informative to support school development planning as it provides objective evidence of the year on year progress that is being made. This data can be used to celebrate success.

2.9 The use of attainment level descriptors within lessons

The reference to the learning outcomes levels within a unit is to give the teacher a rough guide as to the possible range of student attainment in a class. Within a class of students there will be a wide range of diverse levels of student attainment. In order to support the teacher to appreciate this wide range of attainment it is possible to gauge the approximate level within which students find themselves. For example in Form One we might expect all students to be at level seven which is the average level for that year group. Yet within such a Form One class the diverse range of ability may be as wide from level one to level nine. In planning a lesson, teachers need to be aware of this possible range of ability so that effective teaching and learning can take place.

It is very important to note that an attainment level descriptor is a very indiscrete tool not to be used for weekly purposes at a classroom level. Within any one level reflecting annual attainment there will be many sub levels of attainment that different students will reach during a teaching block. Teachers should see the use of attainment level descriptors within the subject units to be a rough guideline to encourage their own more precise planning.

2.10 Avoiding the misuse of attainment levels and indicators of learning outcomes

It is important to note that the results of the attainment level assessment should not be used:

- to inform daily progression because any group of students at one attainment level will still have different levels of understanding
- to indicate a student's actual level of attainment on a daily basis.
- to assume that working in one lesson is equivalent to a year's progress.
- to assume that a student attainment level is the same across different units within the same strand

2.11 Avoiding the misuse of learning outcomes

The indicators of learning outcomes identified within the units are based on the teaching objectives. These indications of learning outcomes are only a small sample of all the learning outcomes that will emerge from a teaching objective. Teachers need to be aware that there are many learning outcomes that different students will achieve during the course of a unit. Teachers should not teach to the learning outcomes.

It is also important that teachers do NOT assume that the indicators of learning outcomes in the unit reflect the focus of the whole unit. The driver of the units is the set of teaching objectives NOT the indicators of the few stated learning outcomes.

When using the indicators of learning outcomes in the units it is important to acknowledge that these are a very rough guide for the teacher to begin to bring down the extensive range of other possible learning outcomes that a teaching objective will facilitate.

3. The structure of units in the Geography curriculum documentation

The curriculum documentation is written in the form of units and has the following content;

3.1 Unit code and title

The title of each unit reveals the content of the unit and each unit is coded for the schools or teachers to record information collected. The consecutive numbers 7 and 8 in the Form 1 and 2 units reflect the year of schooling and have no relation to the attainment levels.

3.2 Strands and Attainment Levels

Each unit reveals the specific strands that are being delivered so as to remind teachers of the teaching aim of that specific strand and provide relevant learning experience for students.

3.3 The teaching objectives

The specific objectives for each unit are drawn directly from the general objectives within the Teaching Objectives Framework. There are the specific teaching objectives within each unit. These unit specific objectives are in two categories, a set for those students who are within their year related range of ability and then a set for those whose ability requires a further level of assessment. Selected from mainstream teaching objectives, these objectives are adapted to suit the needs of students with learning difficulties.

Teaching Objectives facilitate the focusing of knowledge, skill and attitude to be included in a unit. Usually there are three to five teaching objectives in a unit. Teachers may adjust the requirement of target attainment according to students' abilities, and then plan teaching and a variety of class activities accordingly.

3.4 Vocabulary

Relevant vocabulary included in the units that students need to experience and learn.

3.5 Points to note

These should cover reference to the subject approach to teaching and learning, but they may refer to health and safety issues that teachers need to consider and deal when teaching the unit.

3.6 Resources

A list suggesting teaching material required when teaching the unit. These include a variety of materials to support e Learning.

3.7 Examples of teaching experiences and activities.

The teaching and learning content of each unit should correspond to the teaching objectives of the curriculum units. Next to each exemplar teaching situation the specific teaching objective is clearly

stated. The examples given for each specific objective reflect ideas to catalyse and inspire teachers to think of their own ideas and materials. The teaching examples indicate different activities for students who are attaining at different levels. The activities are also written in such a way as to encourage student centred learning. In creating student centred learning opportunities the teacher must appreciate the difference between teaching objectives for the lesson which indicate the focus of the learning opportunities provided, and the learning outcomes which indicate a range of possible responses that students may give.

3.8 Differentiated Learning Outcomes

The differentiated learning outcomes show an indicative range of attainment levels for different students. They are given as a rough guide to stimulate the teacher's planning. In their class the range of attainment may be wider or narrower. In preparing the unit the teacher should reflect on the range of ability of the students in that class. There can do so by referring directly to the attainment levels. As a consequence of the range of attainment levels the teacher may need to plan for different teaching activities occurring at the same time.

4. The units for Geography

The units have three consecutive parts. The first part relates to the attainment levels of students from 5 to 8. The second part refers to attainment levels of students from 1 to 4 and in this part the objectives are similar to those in the first part but they may have been adjusted and this is indicated by the numbering of the objectives. Some units have a third part which refers to elearning activities that relate to all levels of attainment.

The teacher is expected to select the range of objectives (from parts one, two and three) needed according to the range of attainment levels of the students in their class.

5. Assessment Strategies

Assessment needs to be effective, meaningful and must have a purpose. The purpose of Assessment for Learning is to provide feedback for teachers and learners on the teaching and learning taking place on a day to day basis at classroom and school level. This evidence will enable the teacher to adjust the learning programme accordingly in order to improve the quality of learning. Assessment tasks and procedures should be consistent with the aims of each strand of the subject and with the activities being done in class to achieve these aims. In this way assessment will be a vital part of the learning programme. The teacher needs to think of assessment tasks that disclose what has been learnt, what needs further prompting and the next step in learning for the student.

Assessment strategies refer to the different method of data collection and how they are reported in both formative and summative contexts. A number of basic specific strategies include clear and shared learning intentions, specific and reachable success criteria, effective questioning, feedback that feeds forward, self and peer assessment. Assessment for learning and teaching is an essential part of promoting students' active participation at the level of their understanding.

There is an important distinction between strategies to assess attainment as opposed to achievement. Assessment of attainment relates to the 'academic' work in the subjects of the curriculum. Assessment of achievement relates to the broader issues that relate to attainment but includes other concerns such

as student effort and motivation. In this context we can have a student at level three who is a high attainer and a student at Level nine who is a low attainer. Understanding this distinction is important if the teacher is to ensure that effective progression in learning takes place.

Assessment of the attainment level descriptors should only be summative once a year. Attainment level descriptors contain a number of learning outcomes that reflect a small example of all the learning outcomes arising from the units and their objectives. In assessing an attainment level descriptor the teacher should recognize each of these learning outcomes and use 'a best fit' approach in deciding which learning outcomes within a level that a student has attained.

Assessment of unit- based work should be formative and ongoing. As students complete their work examples of it can be kept. The teacher may also make written comments in their own diary and separately encourage the students to write their own evaluation. The collection of this formative data can be used to inform the attainment level that best fits the student. It is important that the evidence be collected systematically to allow objective judgment as well as subjective reflections about the achievement of the learner.

A classroom culture where a growth mindset is promoted needs to be created. It is a culture where learning is a priority, where learners yearn for that information that will stretch their knowledge, where the classroom changes into learning communities. Assessment for learning strategies are further elaborated in the Appendices.

6. Facilitating student centred learning with Curriculum documentation

The curriculum documentation is written to encourage the teacher to ensure that every student has the maximum opportunity to learn. One important element is to reflect on the limited ineffectiveness of the traditional approach of teacher led teaching and to explore the value of student led or student-centred learning as being a more efficient way of encouraging student curiosity and raising standards of educational attainment

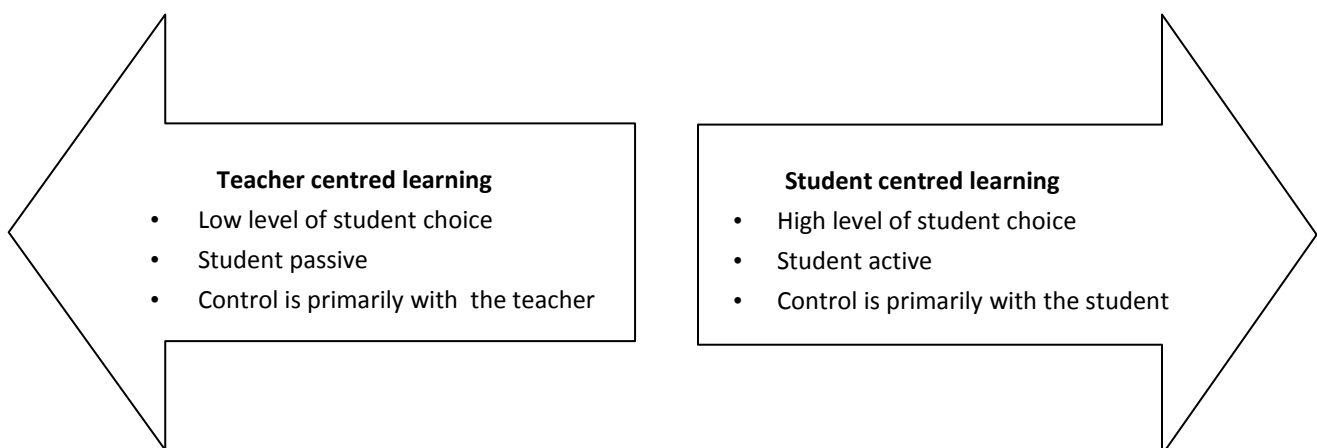
Traditionally teachers have taught their children using the same teacher led teaching method. They have decided on the lesson and one activity that they want to teach to all the students at the same time. Every student had the same experience and sometimes follow up exercises were given for two different groups. Teachers are encouraged to change their approach from teacher-led teaching to student centred learning.

6.1 What is student centred learning?

There are many terms linked with student centred learning e.g. Flexible learning, Experiential learning, Self-directed learning. Student centred learning is about the shift in power from the expert teacher to the student learner. The paradigm shifts away from teaching is to move the power from the teacher to the student. In student centred learning, the teacher is a leader who is perceived as an authority figure in the classroom but is sufficiently secured within themselves to trust the capacity of the others to think and learn independently. The learner has full responsibility for their learning.

6.2 Teacher-centred and student-centred contrary perspectives

There are two very different approaches to enabling students to learn. One is where the teacher tells the students all that he thinks that they need to know. This direct teaching usually is given from the front of the class and the teacher controls all of the student learning by efficiently telling the whole class what needs to be learned. At the other end of the spectrum there is student centred learning where the teacher is only one of several resources available to each different student in the class.



6.3 Student centred learning continuum

Within the various understanding of student centred learning there are a range of interpretations. In the limited interpretation the teacher decides what each individual student needs to know and sets the behavioural objectives to indicate efficient learning. Each student only learns what the teacher tells them but the information is specific to each student. At the other end of the student learning continuum, the student is in total control of what they learn and when they learn it. In this case the transmission of knowledge is not so efficient, but the control of the learning and understanding is very effective because it is monitored by the student themselves. In between these two extremes there are many interpretations of the term 'student centred learning'. The key factor is that the student is in control of the flow of learning information, no matter what are their disability related barriers to learning.

6.4 Implications for curriculum design

In order for a teacher to encourage student centred learning, there needs to be a clear curriculum framework through which students can progress, week by week and year by year. This framework should provide a curriculum of opportunity for each student to follow during their career through school. At the school and classroom levels there needs to be effective and appropriate curriculum design with the following features:

- a. The curriculum should be unitized with clear objectives
- b. Within a unit students should have a choice of what they wish to learn in the lesson

6.5 Lesson planning for student centred learning

Student centred learning requires the teachers to plan their lessons effectively. A lesson plan for a group of students should address the following questions:

- a. Are the indicative learning outcomes clear
- b. What are the identified learning processes for the beginning, middle and end of the lesson?
- c. What resources are identified?
- d. Is there any guidance for behaviour management?

6.6 Understanding the difference between the teacher's lowest conceptual level which is above the students' highest conceptual level.

Across all of the range of ability there is evidence that teachers in a teacher-led teaching context, significantly overestimate the level at which their students are capable of learning. Teachers use their lowest level of understanding to give students access to their lessons. Again and again, at all levels of attainment, there is evidence that the majority of students in a class fail to have a high enough level of understanding to appreciate the lowest level of their teacher. The teachers continue to teach what they know but fail to recognize that many of the students have no idea what the teacher is saying or doing.

This is one of the greatest problems with teacher led teaching. Student centred learning would overcome this as the students level of understanding is the starting point which they control.

7. The use of curriculum documentation for curriculum planning

The value of unitized Curriculum documentation is that they support curriculum planning at both the school and classroom level. This approach means that the attainment of the students drives the balance of the school curriculum and not the subjective decisions of the school's senior management team. In the three tables below we can see that a unitized curriculum within a scheme of work allows the senior managers monitor at a school level what is happening at the classroom teaching level as well as at the classroom timetabling level.

7.1 Teaching hours for the allocation of subjects

At a school level the scheme of work allows for the allocation of teaching hours in Form One

Maltese	English	Mathematics	Integrated Science	Religion	Total teaching hours
84	105	105	84	42	
Geography	Arts Education	History	PSD	Social Studies	
21	21	42	42	21	
ICT	PE	+ 1 foreign language option	+ other option		
21	42	84	42		756 hours

(The above data is based on scholastic year 2010-2011)

7.2 Yearly planning statement

This document can then be converted into a yearly planning statement for each class. This allows the senior management team to understand and then monitor what is happening across one year in any one class.

School Yearly Planning 2011-2012

Form One

	Teaching Block (TB1)	Teaching Block(TB2)	Teaching Block (TB 3)
Maltese	Unit 1 Jiena Unit 2 Film li ma ninsa qatt Unit 3 Int sabiħa o Malta tagħna Unit 4 Darba waħda	Unit 5 Logħob u festi Unit 6 Sur editur Unit 7 L-istorja ta' Jo Unit 8 L-iskola	Unit 9 Jason Unit 10 Storja ta' vera Unit 11 Naraw fejn aħna Unit 12 Aħna tfal bravi
Maths	Unit 1 Properties of whole numbers Unit 2 Angles Unit 3 Number patterns & co-ordinates Unit 4 Decimal number & money Unit 5 Fractions	Unit 6 Metric measures & time Unit 7 Triangles & scale drawing Unit 8 Accuracy & number machines Unit 9 Polygons & symmetry Unit 10 Displaying data, central tendency & probability	Unit 11 Using letters instead of numbers Unit 12 What are directed numbers? Unit 13 What are straight line graphs & transformations Unit 14 Solid Shapes & Volume Unit 15 Solid Shapes & Volume
Geography	Unit 1 Map Detectives	Unit 2 Exploring Malta (1)	Unit 3 Exploring Malta (2)
English	Unit 1 The way we live Unit 2 Going on holiday Unit 3 The world of science Unit 4 The world around us and beyond Unit 5 Families	Unit 6 Friends Unit 7 The right job for me Unit 8 Let's sing & play Unit 9 Adventure Unit 10 Let's play this game	Unit 11 Different ways of buying & selling Unit 12 Let's imagine Unit 13 Television Unit 14 Follow the rules Unit 15 Let's save the world
History	Unit 1 Beyond history Unit 2 Meeting civilizations	Unit 3 The Roman eagle spreads its wings Unit 4 The Roman eagle spreads its wings	Unit 5 Under the rule of the crescent Unit 6 Studying history

Social Studies	Unit 1 Living in a society –socialisation	Unit 2 Living in a democracy	Unit 3 – The person as a consumer – goods & Services
PSD	Unit 1 Getting to know my new school environment & peers Unit 2 All about me	Unit 3 Respecting ourselves & others Unit 4 Understanding growing up changes & making responsible choices	Unit 5 Roles & responsibilities within different social contexts Unit 6 Making good use of my time
Music(General) Music (Option)	Unit 1 Musicking Unit 1 note values, time names & signatures Unit 2 Pitch & pitch inflections	Unit 2 Music in Art Unit 3 Intervals & aural awareness Unit 4 The triad & its application	Unit 3 A golden treasury of medieval & Renaissance music Unit 5 Writing & performing strands
Textile Studies	Unit 1 One way to sew it up! Unit 2 Christmas Stocking	Unit 3 taking a look at textiles Unit 4 rags to riches	Unit 5 Creative Design Unit 6 Colour your Life Unit 7 Outdoor 1 – follow it, find it
PE	Unit 1 Fast, high & far Unit 2 Let’s dance	Unit 3 That’s a cool work out Unit 4 A cool routine	Unit 5 Just between us Unit 6 Send it up high Unit 7 Outdoor 1- follow it, find it
Integrated Science	Unit 1 In the lab Unit 2 Grouping Unit 3 Ecology Unit 4 Energy around us	Unit 5 Energy & sustainable living Unit 6 Chemical reactions Unit 7 Cells & body systems Unit 8 Reproduction	Unit 9 Acids & alkalis Unit 10 Materials Unit 11 Electricity Unit 12 Forces
Religion	Unit 1 My journey Unit 2 The power within	Unit 3 Choosing the way Unit 4 The backpack	Unit 5 Challenges Unit 6 Never alone
Art	Unit 1 The magic of line	Unit 2 A kaleidoscope of colour	Unit 3 Patterns galore Unit 4 Textures to see, textures to touch
Drama	Unit 1 Let’s polish it	Unit 2 How do I behave?	Unit 3 We become someone else

Italian	Unit 1 Start Unit 2 Myself & others Unit 3 On the road Unit 4 In the city	Unit 5 What do you do? Unit 6 My identity Unit 7 The family Unit 8 Whose is it?	Unit 9 My home Unit 10 The Colours of life Unit 11 Daily routine Unit 12 What day is today?
French	Unit 1 Recognising French in various forms Unit 2 My school mates Unit 3 All about myself Unit 4 My clothes, likes & dislikes	Unit 5 Life at school Unit 6 Consolidation & revision Unit 7 My family Unit 8 Time & date	Unit 9 Where am I? Unit 10 Let's visit Paris! Unit 11 Where is all? Unit 12 Consolidation & revision
German	Unit 1 Let's start Unit 2 All about myself Unit 3 Family & friends Unit 4 How much, how many?	Unit 5 Daily routine Unit 6 What is the weather like? Unit 7 Free time & hobbies Unit 8 Yes, of course	Unit 9 What I can do & what I want to do Unit 10 Have you heard? Unit 11 At home Unit 12 Consolidation & revision
Arabic	Unit 1 Let's get started Unit 2 The Arabic Alphabet Unit 3 All about me Unit 4 Identifying yourself & others	Unit 5 Sentence structure & punctuation Unit 6 Family & relatives Unit 7 Colours, Shapes & descriptions Unit 8 My house; types of houses	Unit 9 My school & its environment Unit 10 Can you tell me where is.....? Unit 11 Numbers (1-10) days of the week & months Unit 12 What I have learnt this year
Design & Technology	Unit 1 Gifts of the forest Unit 2 Plastic investigator	Unit 3 Test it yourself Unit 4 Treasures from under ground	Unit 5 One way operation Unit 6 Sensible energy sources
ICT	Unit 1 Collecting and sharing information	Unit 2 Texts, pictures and numbers	Unit 3 Presenting and publishing information

Spanish	Unit 1 Ready, set, go! Unit 2 Hello, how are you? Unit 3 Where are you from? Unit 4 the family is well, thanks.	Unit 5 How hungry! Unit 6 Everyone has their favourite colour Unit 7 Home, sweet home Unit 8 Come on!	Unit 9 My daily routine Unit 10 It's raining cats & dogs Unit 11 More beautiful than most Unit 12 Beach or mountain?
Graph Communication	Unit 1 grasping the principles of basic geometric construction Unit 2 constructing angles & patterns by means of compass & set squares	Unit 3 Constructing triangles & quadrilaterals Unit 4 Constructing circles & polygons	Unit 5 Projecting isometric drawings Unit 6 Introducing information graphics
Home Economics	Unit 1 Discovering Home Economics Unit 2 Pyramid power	Unit 3 Smart snacking Unit 4 Breakfast Time	Unit 5 Sweet Endings Unit 6 Roll up your sleeves

7.3 Weekly Timetable

This document can then be used to identify a time table for any one class according to the relevant teaching block. So for example if we take the subjects for Teaching Block One above we can then produce a timetable for that Teaching Block.

Monday	Tuesday	Wednesday	Thursday	Friday
Maths Unit 1 Properties of whole numbers	PSD Unit 1 Getting to know my school...	English Unit 1 The way we live	Int. Science Unit 1 In the lab	Geography Unit 1 Map Detectives
English Unit 1 The way we live	PSD Unit 1 getting to know my school..	Maltese Unit 1 Jiena	Italian Unit 1 Start	Religion Unit 1 My journey
Maltese Unit 1 Jiena	PE Unit 1 Fast, high & far	Maths Unit 1 Properties of whole numbers	Religion Unit 1 My journey	Maths Unit 1 Properties of whole numbers
ALM Unit 1 Musicking	Italian Unit 1 Start	Maths Unit 1 Properties of whole numbers	English Unit 1 The way we live	Italian Unit 1 Start
Maths Unit 1 Properties of whole numbers	History Unit 1 Beyond History	Italian Unit 1 Start	Maltese Unit 1 Jiena	Maltese Unit 1 Jiena
Home Econ. Unit 1 Discovering home	English Unit 1 The way we live	Int. Science Unit 1 In the lab	ICT Unit 1 Collecting & sharing information	English Unit 1 The way we live
Home Econ. Unit 1 Discovering home	Int. Science Unit 1 In the lab	PE Unit 1 fast, high & far	Social Studies Unit 1 Living in a society-socialisation	Int. Science Unit 1 In the lab

Such a system means that there is a direct and manageable link between what is being taught in the classroom and what is planned at a senior management level. This also means that the results of the attainment levels of student assessment can influence that balance of hours allocated to each subject. If this happens then it is possible to say that the balance of the subjects taught in any school is driven by the student's level of attainment i.e. it is a student centred curriculum.

8. The important contribution of eLearning.

eLearning is about making learning more flexible by providing access to tools that give greater possibilities to teaching and learning. The question, "What can teachers and students do today that they could not do without technology?" has to be the guiding rule that helps teachers and students use the tools to achieve skills that are expected in a 21st century learning environment. Digital technologies give control over to the users as to when and where they study while allowing them to develop at their own pace. Digital technology has the potential to provide a student centred learning environment tailored to meet individual needs.

8.1 Digital Technologies

eLearning provides a range of technologies including:

1. Generic software applications, word processors, spread sheets, and statistical tools which can be used to develop ideas and skills and to present and publish results and findings;
2. Subject specific software;
3. Presentation technologies - including interactive whiteboards, projectors, digital cameras, recording mics and presentation software;
4. The Internet - which provides access to a range of digital resources including on line libraries, databases and "Cloud computing".
5. Conferencing - which includes e-mail, Blogs and Wikis, discussion boards, bulletin boards and chat tools that can support a range of collaborative activities;
6. Multimedia to support a variety of learning styles and includes the use of images, sound, video and animation;
7. Computer assisted assessment - automatic on-line testing which will be available on the National VLE. Some teachers are already using such software that is available on the Web;
8. Computer assisted learning - using the computer to support learning e.g. online tutorials that might include video or animation and feedback within a structured framework;
9. Video conferencing, involving the use of audio and visual communication can be used to share ideas collaboratively;
10. Streaming - digital audio and video delivered via the web can give students access to real situations that might otherwise be inaccessible;
11. Simulations and Models that enable students to explore real world models and develop practical skills in a safe environment;
12. Games including robotics, game consoles and 3D worlds where the student learns through experimentation and interacts with others in a simulated environment;

13. Visualisation tools including mind mapping and concept mapping tools that are used to represent complex information.
14. The list is not exhaustive and the creative teacher will be helped and supported in exploiting emerging technologies to enhance the teaching and learning.

8.2 Leaders' role

Digital technology plays a critical role in allowing teachers to focus on student-centred approaches. Integrating digital technology into the curriculum is an essential way to retool our schools and turn them into learning spaces that will prepare our learners for tomorrow. Integrating technology into the curriculum is not the same as being competent in using the computer. Leaders should stop thinking about technology training and how it can be used in the classroom and start thinking about curriculum training that incorporates technology.

9. Appendices

Appendix 1:

Flexibility in curriculum management progression from a Unit to Teaching

The flexible hierarchical structure of the curriculum

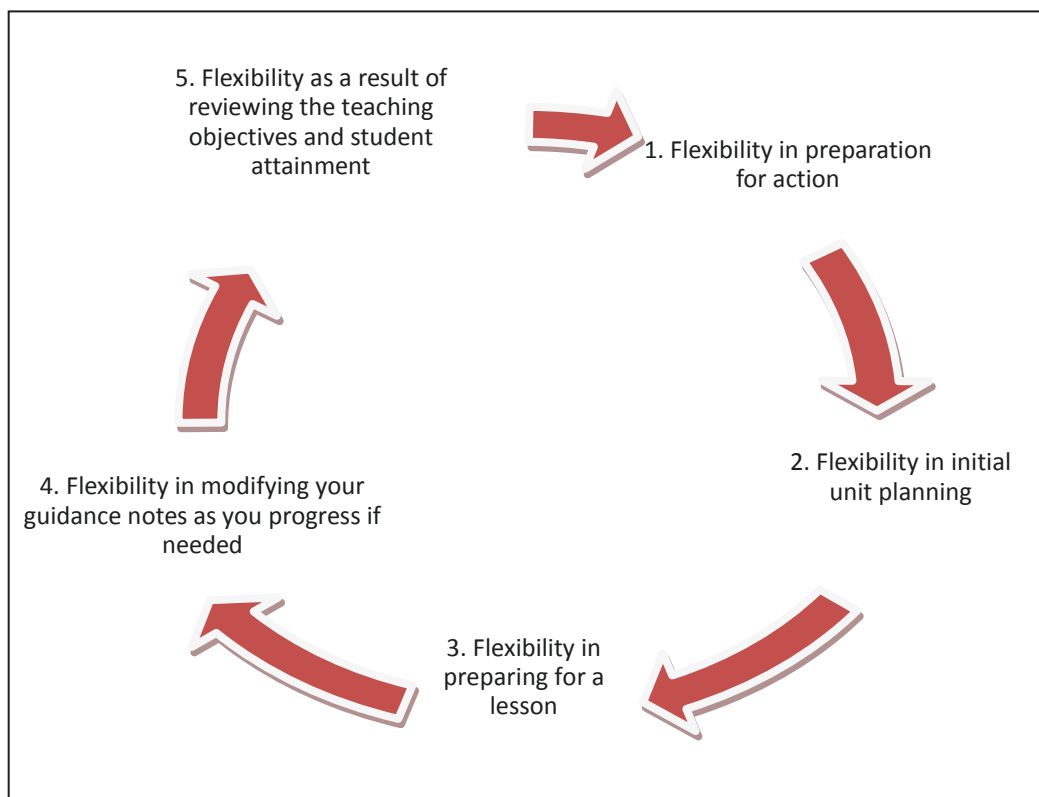
At each level in the hierarchy of the schooling system the curriculum can be flexibly managed. This is more fully explained in the footnote.

- The central curriculum from the DCMEL
- The curriculum of opportunity the whole set of units for each subject at a college and school level
- Subjects scheme of work with the strands, their units and level descriptors at HOD level
- Subject units all the units that make up the scheme of work for each subject at classroom level
- Unit teaching objectives for the teacher's delivery of the subject
- Lesson procedure guidance possible more detailed notes for a lesson
- Student learning outcomes macro for the class and micro for the student

Different forms of flexibility when managing the units at a classroom level

1. Flexibility in preparation for action
2. Flexibility in initial unit planning
3. Flexibility preparing for a lesson
4. Flexibility in modifying the teaching plan as you progress
5. Flexibility as a result of reviewing the teaching objectives and student attainment

Flexibility in developing a teaching implementation strategy at the classroom level



1. Flexibility in preparation for action

Decide the order and how many units to teach within a year and in which teaching blocks.

Flexibility is in choosing the units in the order that suits you. **Example 1** is the recommended one in the handbook. **Example 2** just changes the units within a term.

	Teaching Block (TB 1)	Teaching Block (TB 2)	Teaching Block (TB 3)
Geography Example 1	Unit 1 Map Detectives	Unit 2 Exploring the Maltese Islands (1)	Unit 3 Exploring the Maltese Islands (2)
Geography Example 2	Unit 2 Exploring the Maltese Islands (1)	Unit 1 Map Detectives	Unit 3 Exploring the Maltese Islands (2)

2. Flexibility in initial unit planning

Subject: Geography

Unit code and title: GEO 7.2 Exploring Malta (1)

Strand: The Environment – Physical and Human

Unit Duration: 9 sessions of 40 minutes (6 hours)

Objectives at attainment Level 5, 6, 7 and 8

The teacher will teach:

1. the location and the component parts of the Maltese Islands as well as its position in the Mediterranean and Europe focusing on the location of countries, islands and capital cities;
2. the students to observe, record and forecast the local weather by providing resources;
3. students to discover the characteristics of the geological formation of the Maltese Islands;
4. students to explore the karstic features created by water as it flows through permeable rocks.

Objectives at attainment Level, 1, 2, 3 and 4

The teacher will help students to:

- 1.1 understand the location and component parts of the Maltese Islands and its position in the Mediterranean;
- 2.1 learn about, observe and record the local weather;
- 3.1 become familiar with different kinds of rock in the Maltese islands
- 3.2 explore how sedimentary rocks are formed;
- 4.1 explore some of the features created by water.

- Read the unit as a whole to ensure that you have a picture of what it says.
- Ensure that you appreciate the approach to teaching and learning for that subject e.g. Science and enquiry.
- Reflect on the approach you will take to student centred learning.
- Decide on the teaching situations and learning activities that would suit your class of students Review and if necessary re-write, the range of possible learning outcomes so that they reflect the range of students' attainment levels in your class.

3. Flexibility preparing for a lesson

Decide on Unit Teaching Objectives for the week

1. show the location and the component parts of the Maltese Islands as well as its position in the Mediterranean and Europe focusing on the location of countries, islands and capital cities;
2. provide resources for the students to observe, record and forecast the local weather.

- Insert the teaching objectives for the whole unit
- Identify some key words to be stressed throughout the unit
- Indicate some of the key teaching materials that you will use

Decide on appropriate vocabulary.....

flexibility in deciding the key words to be used

anemometer, maximum and minimum thermometers, rain gauge, Stevenson screen, wind rose, wind vane

- **The plan shown below is to illuminate what is meant by flexibility. It is not intended that the teacher has to write a similar plan although the teacher may make some sort of preparation guidance notes especially if there is an LSA in the class.**
- All of these are but a few examples of the numerous ways in which all groupings can be organized.

Decide on work station groupings of students

- 1 In groupings one there are three similar mixed ability groups working to the same objective but with different activities. Over a period of time the students would alternate around the activities.
- 2 In group two the objective and activity come from unit; In this case the planning follows the guidance.
- 3 In group three the objective is a different one and the activity is as per unit; **Flexibility** In this case is that the order of the objectives are different for different students in the same class as some may have progressed more quickly.
- 4 In group four the objective is the same as group two but the activity is different; **Flexibility** in this case is in the change of teaching activity.
5. In group five the objective is from a different level and the activity comes from the unit; **Flexibility** in this case is in the change of level of objective.

Groupings 1

1

Mary: level 7, Anna level 7, Karl level 6, John level 5, David 3

Teaching Objectives 2

The teacher will:

provide resources for the students to observe and record the local weather. (resources: anemometer, wind vane, rain gauge, minimum and maximum thermometer).

Activity 1

Ask the students to identify the weather instruments presented on their station. Students draw a table with three columns; in the first column they write the name of the instrument, in the second they identify what the instrument measures and in the third they write the units of measurement for each instrument.

2

Peter: level 8, Susan level 7 , Keith Level 6, Roger level 5 Felicienne 4

Teaching Objective 2

The teacher will:

provide resources for the students to observe and record the local weather.

Activity 2

Ask the students to explore through discussion how the weather instruments presented on their station works. For each instrument students should draw an annotated diagram and identify the best location where it can be placed to ensure accurate and valid results.

3

Tony level 7, Alison level 7 , Joseph Level 6, Sophie level 5 Tessa 3

Teaching Objective 2

The teacher will:

provide resources for the students to observe and record the local weather.

Activity 3

Students complete a matching activity using photos of instruments (including the Stevenson screen) and labels with names, appropriate locations and units of measurement.

Indicative learning outcomes

The student's expected response is;

draw simple labelled diagrams of weather instruments (anemometer, wind vane, rain gauge, maximum and minimum thermometers) and identify the best location for each to provide valid results. (Level 7)

know about the elements of the weather and associate weather instrument with the weather element. (Level 6)

distinguish the main characteristics of the weather elements. (Level 5)

distinguish the main characteristics of the weather elements and with help will identify simple instruments. (Level 4)

be aware of weather elements and with help identify one weather instrument. (Level 3)

Groupings 2

Clare: level 7, Peter : level 7, David: level 8

Teaching objective 1

The teacher will:

show the location and the component parts of the Maltese Islands as well as its position in the Mediterranean and Europe focusing on the location of countries, islands and capital cities.

Activity 1

Teacher provides maps and pictures of Europe and the Mediterranean for a game quiz devised by the students themselves in mixed ability teams. E.g. of questions; *What country touches both Spain and Italy? Of which country is Athens the capital city?*

Indicative learning outcomes

The student's expected response is:

develop a good understanding of scale and a fuller awareness of Malta's position in Europe. They know the location of most Mediterranean countries, capital cities and islands. (Level 7)

develop a fuller understanding of scale and a greater awareness of Malta's position in Europe and the World. They know the location of all Mediterranean countries, capital cities and most islands. (Level 8)

Groupings 3

Paul: level 7, Carol: level 7, Michael: level 6, Janet: level 5

Teaching objective 2

The teacher will:

provide resources for the students to observe and record the local weather.

Activity

In groups students will be asked to read the statistical climatic data presented to them to draw a climate graph (temperature and precipitation) for Malta. Some students will be expected to plot the maximum and minimum temperature and the precipitation graphs on graph paper and include labels and title. They may be asked also to describe and explain how annual variations in temperature and rainfall may influence human activities.

Indicative learning outcomes

The student's expected response is:

draw a separate graph for temperature and rainfall. (Level 5)

plot rainfall and temperature graphs on a grid with given axis from data presented. (Level 6)

plot and read climate graphs including average monthly temperature and precipitation from data presented. (Level 7)

Groupings 4

Mary: level 7, Anna: level 7, Karl: Level 6, John: level 5

Teaching objective 3

The teacher will:

help students discover the characteristics of the geological formation of the Maltese Islands.

Activity

Ask the students to move around the prepared stations to handle and examine the samples of the five different types of rock found in Malta. They list the main characteristics of each type and then compare the samples. The students can then write about the different colours, structure (hardness: breaks easily; crumbles; hard) and texture (rough, smooth; humid) of the samples they are examining.

Indicative learning outcomes

The student's expected response is:

match descriptions of each of the five different layers with the appropriate name of rock. (Level 5)

identify and recognise the five different rock strata from clues given. (Level 6)

examine rock samples and identify the five main layers of rocks of the Maltese Islands. (Level 7)

Groupings 5

Petra: level 5, Mark: level 4, Andrew: level 3

Teaching objective 3.2

The teacher will:

explore how sedimentary rocks are formed.

Activity

Teacher helps students to make own sedimentary rock block providing students with a variety of materials such as sand, gravel, soil with sticks and leaves, pebbles, shells, fragmented shells, small fish bones and transparent plastic containers. The students then build their own sedimentary block of rock by taking each item in turn and patting it down to form a flat layer representing the strata. The teacher provides plasticine, sea shells, plastic cups and plaster of Paris and assists the students to create their own fossil cast of a sea shell. Some students will explore the above objects such as shells, gravel, pebbles etc. With hand over hand the students are supported to make their own cast of a sea shell.

Indicative learning outcome

draw simple labelled diagrams to show the main characteristics of sedimentary rocks, fossils and the local geological sequence of rock strata. (Level 5)

be familiar with sedimentary rocks found in Malta as well as identify some common fossils found in our rocky beaches. (Level 4)

be able to recognise one of the most common rocks in Malta, Globigerina Limestone as well as look at and identify at least two common fossils found on our beaches. (Level 3)

Lesson notes

- Make a note of the approximate amount of time that you would devote to teacher centred teaching and student centred learning. You may have two 10 minutes teacher directed sections followed by a 10 minute student reviewed section within each lesson.
- Write the teaching situations and try to make them exciting.
- Write the guidance for teaching those activities to maximise student centred learning.
- Ensure that each supporting LSA has the activity that they are to do, demonstrated to them (not just explained).

- Make sure that everyone knows that the learning outcomes are possible indicators of student response and not teaching objectives.

4. Flexibility in modifying your guidance notes as you progress

4.1 During the lesson

- During the lesson activities glance at the adults to check that they are doing what you expect. If the adult is not doing what you want either show them there and then or talk to them after the lesson.
- Ensure that any behaviour guidance is clear and adhered to.
- At the end of the lesson review the subject content that has been covered and evaluate if you need to make changes for the coming week. You may keep the same content for the whole teaching block or you may insert new activities or content.

Flexibility as the plan of the lesson progresses then you can evaluate

- The appropriateness and effectiveness of the teaching materials,
- The teaching interaction situations,
- The groups and the effectiveness of the adult support
- The quality of achievement from the student
- The actual responses the students give that indicate the level of learning outcomes.

Constantly refer back to the subject unit

- Ensure that the spirit of the unit as shown in the objectives and indicative learning outcomes are clear in your teaching plan
- Reflect on the effectiveness of the delivery of your teaching objectives in the spirit of the unit
- Check that your subject approach to teaching and learning meets the guidance in the Teachers Handbook
- Reflect on whether you have assessed the student at the correct level of attainment that he can achieve without adult intervention.

The modifications to subsequent lessons may be needed if not all objectives are covered. By modifying the teaching plan as the teaching block progresses, adjustments to lessons can be made according to:

- the speed at which the teacher successfully completes the teaching objectives
- the teaching situations can be modified according to the spontaneous inspiration of the teacher
- the student learning outcomes can be individually adjusted, as the learning progresses for different students.

4.2 Reviewing the teaching objectives and student attainment once the unit is completed

- Evaluate the effectiveness of the teaching objectives
- Evaluate the learning outcomes for each student
- Use the above information to inform the planning of the next unit

4.3 Flexibility with the Teaching Objectives

The teaching objectives are to inform the teacher's delivery of the subject content.

- All of the teaching objectives contribute to the Teaching Objectives Framework for the subject.
- The teaching objectives reflect the syllabus of the Central Curriculum that are appropriate to the level of attainment of our students
- Teaching objectives should NOT be referred to as learning objectives. (Learning objectives do not exist within our diversity paradigm)
- Teaching objectives challenge the quality of the teacher's knowledge of the subject they are teaching.
- For ease of access then for Form 1 there are a set of teaching objectives for students who are attaining at levels 5,6,7,8 and a later set in the same units for students who are attaining at levels, 1,2,3,4.

4.4 Flexibility in evaluating learning outcomes

Macro Learning Outcomes are based on the level descriptors and they give us an indication of the range of student responses within an annual review context. They allow the teacher to appreciate the broad range of levels of student attainment in the class and to reflect on the

general differences across a class of students. Here are a set of examples of a set of Macro Learning Outcomes for Geography;

The Teaching objective is; show the location and the component parts of the Maltese Islands as well as its position in the Mediterranean and Europe focusing on the location of countries, islands and capital cities.

The Macro Learning Outcomes are that the students will;

Students will develop a fuller understanding of scale and a greater awareness of Malta's position in Europe and the World. They know the location of all Mediterranean countries, capital cities and most islands. (Level 8)

Students will develop a good understanding of scale and a fuller awareness of Malta's position in Europe. They know the location of most Mediterranean countries, capital cities and islands. (Level 7)

Students will become aware of Malta's position and can recognise a wide range of countries in Europe as well as able to locate the main Mediterranean countries and countries. They can name the capital cities of large European countries. (Level 6)

Students will become aware of Malta's position and can identify a limited range of countries in Europe especially our neighbouring countries within the Mediterranean. They know the location of the main islands and can link the capital cities of some countries. (Level 5)

Students will become aware of Malta's position and can identify three countries in Europe. (Level 4)

Students will become aware of Malta's position and can identify nearest country and the nearest island. (Level 3)

Students will become aware of Malta's position on a map of Europe. (Level 2)

Students will be aware of and explore their natural surroundings. (Level 1)

Micro Learning Outcomes are based on the response of the students to their teaching experience within a lesson. When a lesson activity is first planned the micro learning outcome will be an estimate by the teacher.

- Once the lesson has been taught the teacher can write a realistic outcome statement.
- Each student will have their own expected learning outcomes.
- The ability to attain an outcome should be where the student is in control of the learning and NOT where the teacher is promoting an answer.
- During a Teaching Block a student should develop his/her learning outcome attainment.

Examples of Micro Learning Outcomes could be at Level 6

The Macro learning outcome is; to identify the landforms associated with underground water and explain briefly the processes involved in their formation. (Level 6)

The Micro learning outcome differences may be;

Students in group 1 can describe briefly main underground features such as caves, stalactites, stalagmites, pillars and swallow holes.

Students in group 2 can draw and label simple diagrams of basic karstic features such as underground caves, stalactites, stalagmites and swallow holes.

Students in group 3 can annotate basic karstic features on diagrams provided.

Students in group 4 can identify basic karstic features through the use of interactive games.

5. Flexibility as a result of reviewing the teaching objectives and student attainment

In order to allow learning and teaching to inform each other it is important to review the activity in the classroom from both a teacher and a student perspective. The following criteria may help the teacher to reflect on the flexible criteria that may influence modifications of the teaching and learning process.

Critical review criteria

1. Are the teaching objectives from the unit correctly copied?
2. How are the students put in groups at clearly defined work stations?
3. Does the range of activities fit the allocation of time for that lesson?
4. Is there an appropriate share of the amount of time between teacher centred teaching and student centred learning?
5. Do the teaching activities maximise student centred learning?
6. Are the teaching situations exciting?
7. Do the student learning outcomes differentiate the range of outcomes to be found within one level of attainment?
8. Is there an effective range of student learning outcomes expected for each teaching activity?
9. Do the supporting adults have clear written directions?

Foot note on curriculum management and flexibility

- At every hierarchical level of the schooling process the curriculum can be flexibly managed to ensure that the best quality of education is provided to the students. The different levels of management are DCMeL, College, SMT, HOD and Classroom.
- By curriculum management we are referring to the process whereby the co-ordination of the levels of attainment of each of the students are matched by the managed provision of the full range of educational resources, human, physical and financial.
- In a curriculum that is underpinned by the need to respond to diversity and student centred learning, then at each level there are two important features. In this case we are referring to curriculum management features for classroom teachers.
- The first feature is the need for teacher freedom to flexibly make decisions on how best to use the resources available. The second feature is the need to have responsibility so that the decisions that are made need to be evaluated.
- In this case the EO and HOD give the teacher a set of units which the teacher has flexibility to deliver. Conversely the teacher then is responsible to the head of school and the EO for evaluating the effectiveness of the planning as indicated by the progression in attainment of the students.
- Flexibility and responsibility of managing the curriculum at the higher levels will be referred to in another paper in future. At every level it is the successful progression in attainment level of the students that drives the management of the full range of curriculum resources.

Appendix 2: Approaches for Teaching and Learning for Geography

Geography is the discipline which seeks to explain the character of places and the distribution of features and events as they occur and change the surface of the earth. Geography is concerned with human – environment interactions in the context of specific places and locations. In addition to its central concern with space and place, it is characterised by a breadth of study, a range of methodologies, a willingness to synthesise work from other disciplines and an interest in the future of people – environment relationships.

Geography often starts with the following questions:

- Where is it?
- What is it like?
- Why is it there?
- When did it happen and how does it change?
- What impacts does it have?
- How should it be managed for the mutual benefit of humanity and the natural environment?

Finding answers to these questions requires investigation of the location, situation, interaction, spatial distribution and differentiation of features. Explanations of current situations come from both historical and contemporary sources. Trends can be identified which indicate possible future developments.

Some of the central concepts of geographical studies are location and distribution, place, people-environment relationships, spatial interaction, and regions.

As stated in section 2.3 the teaching objectives of geography can best be achieved through a range of approaches.

Learning through fieldwork

Fieldwork provides opportunities for the first-hand investigation of people in their environment and as such awakens students to a diversity of environments and cultures, in their local area and beyond. It teaches students to collect, analyse and present data, sharpening their observations, measuring, recording and evaluation skills. As such, fieldwork has important contributions to make geography real and enjoyable and as a result every geography student should be entitled to have a reasonable amount of exposure to fieldwork experience through the geography course. Fieldwork should not be limited to visits and guided tours, whereby students are involved only in passive activities such as listening, observing and note-taking. Fieldwork should be enquiry-based in-line with the aims and objectives of this curriculum. It should involve students in identification of an issue or problem in a specific area, collect, present and analyse data and finally identify possible solutions or strategies.

Learning through maps

Maps in the form of paper, digital images and globes are an important tool for geographers and enable us to record, display and analyse information about people and environments. Teachers should ensure that their students are able to master a reasonable level of mapping skills and integrate such skills into the learning and teaching of geographical issues in the curriculum. Understanding and using maps involve the simultaneous use of a number of concepts and skills including aerial perspective, proportion, map language and arrangement. Students should be given the opportunity to develop their map literacy so that they can use maps to find out about and interpret the world around them in a critical informed way. In an enquiry based approach students should have access to a wide range of maps including large

wall maps, atlases, globes, maps on CD-ROMs and other electronic media, including *Google Map* and *Google Earth* as well as a wide range of Ordnance Survey maps at various scales.

Learning through information technology

Information and Communications technology whether it is a personal computer, an interactive whiteboard, or a mobile phone influences how students make sense of their world today and at the same time offers a range of tools to support their geographical understanding. Specific programs such as Google Earth can improve spatial thinking and electronic media and the internet enable students to gain up-to-date information and access to a vast range of images, videos, data and other sources which can greatly enrich geographical understanding. By the use of IT teachers have the power to make lessons livelier and enjoyable thus enhancing students' learning motivation. Geography teachers should provide adequate opportunities for their students to apply IT in their enquiry-based approach to the teaching of the subject. This is because IT:

- provides a range of information sources to enhance geographical understanding
- supports the development of a body of geographical knowledge
- provides images of people, places and environments
- helps students develop their ideas using ICT tools to amend and refine their work and enhance its quality and accuracy
- helps students exchange and share information, both directly and through electronic media
- provides students with the ability to review, modify and evaluate their work, reflecting critically on its quality as it progresses
- contributes to pupils' awareness of the impact of information systems on the changing world
- contributes substantially to the development of a range of ICT capabilities, especially in regards to data handling, use of communication technologies and information sources and modeling
- develops the students' skills in the following ICT toolkit namely word processor; spreadsheet; presentation software; desktop publishing (DTP) software; internet browser/e-mail; electronic atlas; electronic encyclopaedia; geographic information system (GIS); automatic datalogging weather station; digital camera.

The units presented in the curriculum provide opportunities for using ICT and over the whole course a full range of approaches will be used to develop students' ICT capability and enhance the quality of their geography experience.

Learning through the use of resources

A good geographical enquiry usually involves the use and analysis of a rich variety of resources including worksheets, textbooks, maps, models, computer software, interactive games, the internet, newspaper resources, weather instruments, specific items (rock samples and tools) and many others. Very often such resources arouse students' motivation and engage them in active learning situations that meet their varied needs. Besides this, such an extensive range of resources enhance students' learning experiences and are seen by many as a key attraction of the subject. Ideally geography should be taught in a special room allotted for the purpose which includes:

- adequate space for students preferably equipped with desks with flat surfaces for practical work especially map work;
- spacious environment for the storage and effective use of resources including, maps, books, charts, apparatus, posters and handouts;
- various kinds of wall maps including those of the Maltese Islands, Mediterranean, Europe and the World;
- globes, including political, relief and activity globes that can be marked and cleaned;
- meteorological and fieldwork instruments;
- computers with internet access;
- interactive whiteboard;
- water supply for use in simple experiments and model making.

Students should be encouraged also to handle and use such resources during breaks or when geography related extra-curricular activities are being organised in school.

Learning through the use of games and simulations

The philosophy underlying the use of games and simulations is in close harmony with enquiry-based approach to the teaching of geography. Role playing and simulation call for:

- powers of analysis and synthesis
- an ability to think ahead from an exciting situation
- anticipating the probable actions of opponents
- foresee the consequences of alternatives
- to evaluate the pros and cons of alternative courses of action one might take.

The peculiar appeal of all these approaches is the radical way in which they alter the learning environment. Students move from the audience to the stage. Hence, students become active learners acquiring geographical concepts and knowledge in a challenging and authentic way.

Appendix 3: Locational Knowledge in Geography

Geography deals with spatial distribution and places and therefore locational knowledge of the most important and relevant places by means of maps is a vital tool and means of reaching most learning outcomes. Students will be given opportunities to locate places and environments using a range of resources including maps, globes, atlases, digital atlases, interactive games and internet satellite images. In particular students can set relevant international events within a geographical framework and understand spatial relationships. The table below includes a list of places whose map location should be known by the students by the end of each year. These should be taught as an integral part of each related unit. Maps and wall maps will still be used throughout the year for consolidation.

Locational Knowledge - Form 1

Maltese Islands	
	Places and Environments
Component parts of the Maltese Islands	Malta, Gozo, Comino (L5)
Capital Cities	Valletta (Malta), Rabat (Gozo) (L5)
Smaller Islands	Cominetto, Filfla, Fungus Rock, Manoel Island (L6)
Important Settlements (apart from capital cities)	Student's home town and school (L5), Sliema, Rabat, Mdina, Marsaxlokk, Mellieħa, Mgarr (Gozo), Bormla, Birgu, Mellieħa, Gudja (L6), B'Kara, Mosta, Qormi, Żabbar, St Paul's Bay, Żejtun, Żebbuġ, Fgura, Paola, Ħamrun, San Ġwann, Attard, , Naxxar, Luqa, Xagħra, Nadur (L7)
Popular Beaches	Mellieħa (Għadira) Bay, Marsalforn, Xlendi (L6), Armier, Paradise Bay, St Paul's Bay, Għajn Tuffieħa Bay, Pretty Bay, Ramla l-Ħamra Bay (L7)
Tourist Attractions	Għar Dalam, Mnajdra and Haġar Qim temples, Mosta dome, Tarxien temples, Hypogeum, Calypso cave, Ġgantija temples, Dwejra, Grand Harbour, Marsamxett Harbour (L7)
Fishing Villages	Marsaxlokk, Mgarr (Gozo) (L6)
Mediterranean	
	Places and Environments
Countries of the Mediterranean	Malta (L5), France, Italy, Greece, Libya, Tunisia, Cyprus (L6), Spain, Portugal, Slovenia, Croatia, Bosnia, Montenegro, Albania, Turkey, Syria, Lebanon, Israel, Egypt, Algeria, Morocco (L7)
Capital cities	Madrid, Lisbon, Paris, Rome, Zagreb, Athens, Ankara, Damascus, Beirut, Jerusalem, Cairo, Tripoli, Tunis, Algiers, Rabat, Valletta, Nicosia (L6)
Islands (excluding island states)	Balearic Islands, Corsica, Sardinia, Sicily, Crete (L6)
Openings of the Mediterranean to other seas	Suez Canal (to the Red Sea), Str. Of Gibraltar (to the Atlantic Ocean), Dardanelles (to Sea of Marmara /Black Sea) (L6)

Europe	Places and Environments
Countries of the EU	United Kingdom, Republic of Ireland, Luxembourg, Belgium, Netherlands, Germany, Denmark, Sweden, Finland, Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Austria, Hungary, Romania, Bulgaria (L7)
Capital Cities	London, Luxembourg, Brussels, Amsterdam, Berlin, Vienna, Budapest (L7)
Non-EU Countries	Albania, Turkey (L6) Norway, Iceland, Switzerland, Andorra, Monaco, San Marino, Liechtenstein, Vatican City, Croatia, Bosnia and Herzegovina, Serbia, Montenegro, Former Yugoslav Republic of Macedonia, Russia, Belarus, Ukraine, Moldova, Georgia, Armenia, Azerbaijan (L8)
Other important EU cities	Strasbourg (L7)

The World	Places and Environments
The Continents	Africa, Asia, Europe, North America, Oceania, South America, Antarctica (L6)
The Oceans	The Atlantic, Pacific, Indian, Arctic, Southern (L6)

Locational Knowledge - Form 2

Mediterranean	Places and Environments
Fold Mountains	Alps, Atlas, Apennines, Pyrenees (L6), Dinaric, Pindus, Taurus (L7)
Volcanoes	Etna (L5), Vesuvius(L6), Stromboli, Volcano, Santorini (L7)

The World	Places and Environments
Main lines of Latitude and Longitude	Equator, Prime Meridian (L6), Tropic of Cancer, Tropic of Capricorn, Arctic Circle, Antarctic Circle, International Date Line (L7)
Poles	North Pole, South Pole (L6)
Deserts	Sahara (L5), Arabian, Kalahari, Australian, Californian, Atacama, Thar deserts (L7)

Appendix 4: Assessment in Geography

Assessment has always been a vital part of teaching and learning and serves several purposes including:

- **Formative** so that a student's achievement can be recognised and so further steps planned
- **Diagnostic** through which learning difficulties can be identified and appropriate measures can be taken
- **Summative** through recording students' achievement in a systematic way
- **Evaluative** in enabling the school's work to be assessed.

However, we would all accept that the 'educational' purpose of assessment is to give feedback to students to help them progress in their learning. Formative assessment or **Assessment for Learning** in contrast to assessment of learning is concerned with helping teachers and students monitor and make judgments about their progress identifying the next small steps necessary for improvement. In other words assessment for learning helps both parties (students and teachers) realize what has been learned, what problems there are in the current learning process and which areas of study may need further work. It is something that should be on-going in order to provide feedback to teachers and their students to make the necessary changes in their teaching and learning activities to promote improvement thus making learning more effective. By introducing Assessment for Learning strategies, teachers can help students to critically analyse the quality of their work and how this can be improved. In this way assessment is used to raise attainment levels widening opportunities for learning rather than to grade the levels of students' attainments.

In everyday geography lessons, assessment for learning can be implemented through a number of tried and tested practices namely;

- expected learning outcomes and goals shared and discussed at the beginning of each lesson
- teachers share the learning requirements with their students helping them know and recognise the standards they are aiming for and what success looks like
- provide opportunities for self- and peer assessment
- improved feedback, focused on the value of what has been achieved
- improved feedback so that the students know what should be done next for improvement
- a collaborative approach to learning with a strong emphasis on analysis, discussion and reflection
- an atmosphere that ensures students do not feel bad if they make a mistake.

Assessment Strategies

Assessment in geography must assess the student's understanding and application of the main geographical concepts and knowledge, the acquisition of basic geographical skills and the development of attitudes and values contributing to sustainable development. A range of assessment techniques will be necessary and all of these approaches should arise as naturally as possible for students to perform to their true ability.

Much of the most valuable information about students' achievements comes from day-to-day observations, especially through effective questioning and discussions as the students work. Such information is necessary to make judgments of what they know, what are their strengths, weaknesses and misconceptions; thus adjusting the pace and choosing the most appropriate teaching strategies to reach the learning objectives. This can be achieved through observation and listening to students as they work; the responses the students make to questions set; participation of the student in class

discussions; marking and providing quality feedback to student's work; reflecting on and critically evaluating their own work as well as through the involvement of students in peer assessment processes.

Valuable information about students' attainment can also be observed and assessed while students are engaged in a range of classroom situations. These activities may include: collecting information from primary and secondary sources; direct observation in the field; predicting outcomes after conducting simple experiments; recognizing patterns; completing work cards or handouts; oral presentations; written work or class tests; drawing and analyzing maps; using and interpreting graphs; collecting information from electronic media; carrying out independently geographical research and recording and presenting results in project work. The use of a range of tasks incorporating different levels of difficulty and in diverse modes will enable the teacher to assess more accurately the level of geographical understanding of students with different aptitudes and abilities.

These types of formative assessment procedures give teachers the most valuable information about students' attainments and have the most impact on their progress. However, summative assessments such as half-yearly exams produced by schools and colleges and yearly examinations set by the Education Assessment Unit should not be used simply to rank students' performance or perhaps to inform parents about students' attainment. Such examinations can also have a formative element by encouraging students to reflect on their performance, and at the same time helping teachers evaluate the success of their teaching and setting targets for improvements.

Students' progress can be documented and assessed through the collection of a range of samples of their work in geography portfolios. It may contain a small sample of evidence which exemplifies student's efforts and may include map work, photographs of models constructed, write ups and images of places visited, record sheets from experiments, together with student's written work in the form of handouts or research work from secondary sources such as the internet. Although portfolios are particularly suited to the assessment of geography there is still no statutory requirement for schools to produce portfolios of any kind.

Assessment Strategies and Practices	
Classroom Observation	<p>Effective Questioning</p> <p>Whole class discussion</p> <p>Interaction of students in group work</p>
Feedback by marking	Prompt and regular constructive feedback/comments to students providing suggestions about the ways students can improve their work.
Objective Tests	Completion tests, true/false questions, matching questions, multiple choice questions, cloze (fill in the blanks) questions.
Extended Writing	<p>Short questions and essay questions</p> <p>Research based essays</p>
Structured Questions	Data response questions – the student has a clear idea of what is required of him/her. In such questions, stimulus material, providing information to the student has to be analysed and interpreted. It is advisable to incorporate a wide range of pictorial and graphical material in such questions.
Enquiring	<p>Using primary sources – usually involving simple experiments and fieldwork activities.</p> <p>Using secondary sources – a teacher planned enquiry-based exercise.</p>
Oral assessment	<p>Presentation: student prepares and delivers a verbal report to an audience.</p> <p>Discussion work: students interact within a group</p>
Self assessment	Involving students in critically analyzing their own work, reflecting on their learning process, in particular the difficulties encountered, outcomes reached and the identification of targets in need of further development.
Peer assessment	Peer assessment enables students to give each other valuable feedback so they learn from and support each other. It promotes independent learning, helping students to take increasing responsibility for their own progress.
Success Criteria	Giving students goalposts to aim at is clearly important and extremely useful. Progress is very often accelerated when students are provided with clear success criteria for the intended outcomes.

Appendix 5: Assessment for Learning – important general principles

Assessment for Learning (AfL) occurs when evidence is used to adapt the teaching to meet the needs of the students. Assessment for Learning enhances learning for all types of students because it is there to build a bridge between what is known and what lies on the next step.

1. Understanding what students know

Before starting to teach a new topic or concept, we need to become aware of what are the pupils' perceptions on the subject. Techniques that can be used include Brainstorming, Questioning, Survey, Concept Mapping, Mind web, Discussion, Short test, Evaluate written work done at home or at school.

2. Effective Questioning Techniques

We should consider the use of open challenging questions which allow a range of correct responses and require students to think. More wait time is required. This wait time has to be of around five seconds. Students usually leave the answering of questions to the few most able students in class or else when we use a 'hands up' technique, only those that are sure of the answer put up their hand as the others would not want to risk. What about the rest of the students? How will we know that these students have grasped the concept or the skill? Therefore avoid the hands up technique and give everybody an opportunity to answer. Questions can be of the following type:

- **Literal Questions**
Simple recall: Who? Where? When? What?
- **Application Questions**
Can you think of another situation similar to this?
Do you know of another story that deals with the same issues?
Do you know where else this can be used?
- **Analytical Questions**
What makes you think that?
Can you support your view with evidence?
Why do you think this was written/given in such a way?
Why did you decide to do it in such a way?
- **Synthesis Questions**
What is your opinion?
What evidence do you have to support your view?
Given what you know about... what do you think?
If you were.... what would you think
- **Evaluation Questions**
What makes this ... successful?
Does it work if done in another way?
Which is better and why?

3. Oral Feedback during the lesson

Feedback is fundamental. It gives the opportunity to students to improve in their learning. Feedback has to be from teacher to student, student to teacher, and student to student. Good Oral Feedback should

1. focus on the student's work not on the person
2. state specific ways on how the work can be improved
3. compare the work the student produced with what was previously done
4. do it all along the activity
5. be critically constructive use
6. comments that push the learning forward
7. use a language that does not intimidate the students
8. consider all the students' comments
9. focus on the learning intentions explained at the beginning

4. Oral and Written Feedback after the lesson

'It is the nature, rather than the amount, that is critical when giving pupils feedback on both oral and written feedback'. (Black 2004)

Written feedback can be in the form of grades or comments or both. A numerical mark does not tell the students what needs to be improved in their work and therefore an opportunity to enhance their learning is lost. When a comment is written next to the grade, students tend to ignore the comment and all the corrections the teacher does. The mark becomes a measure of their ability.

Give students the correct advice that would lead them to correct their mistakes. This advice has to be concordant with the learning intention. The advice should be a very short piece of information about where the students achieved success and where they could improve against the learning intention.

The work should go back to the student who must be given time to carry out the requested changes. The work will then go back to the teacher who will correct it and give another advice on what can be done next to enhance learning.

Comments need to begin with what has been a success by showing what needs to be improved and by giving advice on how this improvement can be achieved.

The feedback given has to cause thinking and students need to be given time to answer

- Focus on specifics by asking a specific question about what went wrong
- Delve and ask questions that prompt a student to be more specific

The feedback given should stimulate the student to improve. It should be challenging enough to motivate the students to learn. Visible improvements will increase the students' self-esteem.

5. Promoting Self-Assessment and Peer-Assessment

Self-Assessment

Many studies show significant progress made by children who have been trained to be self-evaluative. At the end of every lesson students are asked to produce reflective comments about their learning, followed by a teacher's summary, unravelling misconceptions that might have been created and providing links with future learning. Self-evaluation has to be linked with the learning intentions and this will lead to student progress, more persistence and a higher self-esteem from the students' part.

Training students to be self-evaluative;

1. Explain why a self-evaluation is needed. Significant progress is made by students who are self-evaluative. When they compare their learning against the learning intentions, they understand where they stand in their learning. Then they can ask the necessary questions to move forward.
2. Recap the learning intention a number of times during the lesson.
3. Be prepared with a number of questions for the end of the lesson.
What did you find most difficult to learn?
Is there something which you are still unsure about?
Is there anything you need to know more about?
4. Give students some thinking time (15-30 seconds) to answer the above questions.
5. Use different approaches to get the answers for the above questions such as whole class responses, paired-responses, group responses.

Peer-Assessment

When students are given the opportunity to verbalise what they have learnt, their brain will start processing the data by giving it a structure, forming bridges between what is new and those concepts/perceptions that they had before. This will make students aware of what has been learnt and what needs further clarification. Therefore it is of extreme importance that teachers give space and time for students to speak about the topic in question. Peer-assessment is the ability to assess the work of others, whether it is written, spoken, painted or any other practical piece of work. Students will be able to perform peer-assessment only if the teacher has given them clearly stated success criteria against which they can perform assessment. Skills which form the basis of peer-assessment: Students have to learn to observe to form an opinion and to know why they have formed that opinion.

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Appendix 6: Digital Technology Enhanced Learning.

Using Digital Technology to enhance learning is a requirement of the National Curriculum. It is the entitlement of all students. The entitlement documents that follow are not intended to be exhaustive, but indicate where Digital Technology might usefully support students in acquiring knowledge, being creative, collaborative and in communicating appropriately and effectively.

In many secondary schools access to Digital Technology at this point in time poses a number of challenges, so careful planning is necessary to use even a small amount with all students. The situation in Primary schools is less challenging as each class has at least three PC and the teacher's laptop. As any reform is a journey rather than a one-off event, it is envisaged that the entitlement documents will be updated periodically to accommodate new emerging technologies. It is not intended that all of the suggested links and possible activities be used and those described may be used in different ways. Some activities and ideas lend themselves to using the teacher's laptop and the interactive whiteboard at its most basic function. Other activities and ideas work best with a networked system and portable computers, and which make best use of the virtual learning environment. Students may be able to use ICT at home and this should be encouraged where it is appropriate.

The suggested ideas (at the end of each unit) exploit the software that already exists in school or is available freely in the public domain or cloud. Many of the activities are straightforward and easy to put in operation. Others may require support from e-Learning Champions in the school. In any case the best idea is for class teachers to consult the school's e-Learning Champion about what they want to do and how it might fit in the curriculum. It is not the intention of the e-learning entitlement documents to deliver students' ICT capabilities although some activities will consolidate what the students learn during discrete ICT and Computing lessons.

The PC and other digital technology

Primary and secondary school students need to be taught 21st century skills if they are to thrive in the technology-infused job sectors they will enter in the future. We need to fuse the traditional 3 Rs with critical thinking and problem solving, creativity and innovation, communication, and collaboration. It is no longer enough to instruct students in spoken and written communication. They need to be taught to communicate electronically including netiquette, email and Web interactions. Collaboration today happens also virtually, where materials and documents are shared without regard to physical space. More collaboration will be occurring in 3D, immersive environments so students need to be adept at navigating virtual worlds. It follows that students should be given opportunities to apply and develop their ICT capability through the use of digital technology and Web 2.0 tools to support their learning in all subjects.

Students should be given opportunities to support their work by being taught to:

- find things out from a variety of sources, selecting and synthesising the information to meet their needs and developing an ability to question its accuracy, bias and plausibility;
- develop their ideas using ICT tools to amend and refine their work and enhance its quality and accuracy;
- exchange and share information, both directly and through electronic media especially Web 2.0 tools; and,

- review, modify and evaluate their work, reflecting critically on its quality, as it progresses.

Bloom's Digital Taxonomy

Bloom's Taxonomy in its various forms represents the process of learning. The six levels by Bloom have been simplified in some cases, like the three storey intellect inspired by Oliver Wendell Holmes and adapted to education by Art Costa, but basically Bloom's Taxonomy still represents how people learn. Bloom's revised digital map is an update of the original 1950 and 2000 map and accounts for the new behaviours, actions and learning opportunities that emerge with new technologies. The digital taxonomy addresses the following skills:

Key Term	Thinking skills	Digital skills	Low order thinking skills ↑ High Order thinking skills
Remembering	Recognise, listen, describe, identify, retrieve, name, locate, find	Bullet pointing, highlighting, bookmarking, social networking, social bookmarking, searching, Googling, local bookmarking.	
Understanding	Interpret, summarise, infer, paraphrase, classify, compare, explain, exemplify	Advanced searching, Boolean searching, blogging, twittering (micro-blogging), categorising, tagging, commenting, annotating, subscribing.	
Applying	Implement, carry out, use, execute	Run, load, play, operate, hack (reconfigure or re program a system), upload, share, edit	
Analysing	Compare, organise, deconstruct, attribute, outline, find, structure, integrate	Mashing-up (as in layering of images on maps), link, validate, reverse engineer, crack, media clip	
Evaluating	Check, hypothesise, critique, experiment, judge, test, detect, monitor	Comment in blogs, post, moderate, collaborate, network, refactor (as in improving code readability, i.e. undertaking tiny changes in program code to improve software), testing new code	
Creating	Design, construct, plan, produce, invent, devise, make	Program, film, animate, blog, video blog, mixing and remixing, wiki-ing, publishing, video casting, podcasting, directing	

Appendix 7: Matching software to Attainment Levels 1 to 3

The following level 1, 2 and 3 attainment level statements all contain examples of software that can be used to support teaching activities.

Level 1:

A1i Using Big Bang, Switch It Patterns to attract attention, student may be passive or resistant.

A1ii Using Switch It Series, student shows alertness and simple reflex responses.

A2i Switching on a fan or tape recorder using a switch, watch and track images on a screen using Big Bang, Big Bang Patterns.

A2ii Turn towards familiar music and stories and respond to familiar events in a story. Repeatedly press a sequence.

A3i Communicate intentionally to ask for computer, press the Go button on a BeeBot to repeat a movement. Show pleasure at the responses e.g. Switch It Series build up.

A3ii Initiate a program - e.g. Touch Games, Switch it Maker 2 to start the sequence. Anticipate the next step in a program e.g. Choose and tell Legends. Use two switches to make a choice e.g. Switch Skills for Two, Choose and Tell Series. Use Choose it Maker 2 to make a simple decision. Show awareness of problem-solving e.g. pressing a switch repeatedly when the computer has been switched off.

Level 2

A4 Students recognise their own image (digital photographs in Switch It! Face Maker), start a story on a DVD.

A5 Matching activities in Skill Builders Matching Skills, Sorting Skills, recognising numbers and alphabet letters in Choose It Maker 2, Clicker 5. Use a communication grid to make needs and wants known Boardmaker Plus, The Grid 2.

A6 Use the computer or portable communication device to send a message, write their own name in Clicker 5, Symwriter. Save and retrieve work they have done in Clicker 5. Follow a set of instructions to control the Constructa-bot, Pro-Bot. Switch on the computer and load a familiar program independently

Level 3

A7 Choose which images to include in Switch It Maker 2. Give directions and instructions and use symbols to write messages in Clicker 5, Symwriter, Communicate in Print 2

A8 Record own voice on Easi-Speak or computer program e.g. Switch-it Maker 2, put together their own slide sequence using Switch-it Maker 2, select and insert a clip art into a word processor, Select a range of tools from a toolbar in Clicker 5, make animation in Textease.

Appendix 8: Online resources for attainment levels 1 to 3

The following list details sources of free software and guides that can be used to support students with individual educational needs and the use of Assistive Technology.

ACE Centre Advisory Trust <http://www.acecentre.org.uk>

ACE Centre access software, a free version of Switch Access to Windows plus Windows shareware.

Call Centre <http://www.callcentrescotland.org/resources>

Downloadable communication boards and resources, BoardMaker V6, Clicker 5 and PowerPoint resources.

Children's BBC (CBBC) <http://www.bbc.co.uk/cbbc/>

BBC web site for children with switch accessible online games.

Communication for All <http://www.communication4all.co.uk/>

An interesting website which supports inclusion

Crick Software Ltd <http://www.cricksoft.com/uk/> and <http://www.learninggrids.com/uk/>

freely downloadable Clicker 5 grids, a software package used to support students across all curricular areas.

Do to Learn <http://www.dotolearn.com>

Games, songs and fun activities.

Enchanted Learning <http://www.enchantedlearning.com/Home.html>

Online curriculum material including Languages, Physical Sciences, Geography, Sciences, Maths, Music.

Help kidz learn <http://www.helpkidzlearn.com>

a number of activities which can be used with a switch, tracker-ball or other hardware.

Hiyah <http://www.hiyah.net/software.html>

downloadable games including pre-literacy and early maths skills.

Inclusive Technology <http://oneswitch.org.uk/>

Ideas, games and resources for art, music and playing video and computer games using switches.

Intellitools Inc <http://www.intellitools.com/>

Activity exchange area including the Intellikeys concept keyboard and Classroom Suite.

Jigsaw Planet <http://www.jigsawplanet.com/>

Can create a puzzle with a minimum of 6 to a maximum of 200 puzzle pieces.

Mayer-Johnson resources www.mayer-johnson.com

Software downloads and a 30 day trial version of Boardmaker symbols.

Meldreth Manor <http://atschool.eduweb.co.uk/meldreth/textandinfo/comp.html>

Meldreth Manor School has downloadable PowerPoint and Illuminatus switch activities.

Northern Grid for Learning <http://www.northerngrid.org/sen/dbsenmain.htm>

Appendix 8:

Attainment Level One explanation.

This appendix is for teachers of those students who are attaining at Level One. In psycho-medical terms the students at this level have profound and multiple learning difficulties and many of them are to be found in mainstream schools. A smaller percentage is in St Miguel and Helen Keller schools.

A theoretical underpinning to early thinking skills

An overview of Piaget's stages of cognitive development

First Stage Sensorimotor	Birth to 18 mo.	Infant interacts with the world through actions such as crying, regulated gestures, and exploring.
Second Stage Pre-Operational	2 yrs to 7 yrs	Pre-schoolers relate to their world through symbolic reasoning, magical thought, and continued sensorimotor activity.
Third Stage Concrete-Operational	7 yrs to Adolescence	Children begin demonstrating logical thought by using concrete examples from the world around.
Fourth Stage Formal Operational	Adolescence into Adulthood	Adolescents go beyond concrete examples and begin engaging in abstract thinking.

The sensori motor development

In order to understand how to develop mathematical thinking in pupils who are functioning at attainment level one, we adopted an approach based loosely around sensori motor perspective on cognitive development from 0-2 years of age Piaget (1955). This approach is illuminated in the following text whereby the six strands formed the focus of learning, and the three levels of circular reaction formed the developmental levels of progression in learning that became the basis of the P scales 1-3.

Piaget's sensori motor development and the attainment level scales,

A) Strands of development adapted from Uzgiris and Hunt (1975)

1) *The Development of visual pursuit and the Permanence of Objects*

Fixating on and tracking objects, recognising the continued existence of partially hidden and hidden objects, retrieving partially hidden and hidden objects

2) Means of Obtaining Desired Environmental Events

Increasingly complex ways of asking things happen. Getting repetition, various ways of getting objects, strategic planning for achieving ends.

3) The Development of a) vocal and b) Gestural Imitation

- a) differentiated coos and distress sounds, imitation of sounds already in repertoire, imitates some new sounds, will imitate most sounds
- b) Imitates familiar own body actions, imitates visible gestures, imitates invisible gestures, imitates new models of gestures

4) The Development of Operational Causality

Increasing levels of understanding about what makes things happen. (Some overlap with scale 2). Profound egocentricity, self at the centre of all events, self and others making things happen.

5) Construction of Object Relations in Space

Increasingly complex understandings of spatial relations. Tracking, grasping, appreciation of spatial effects e.g. gravity and position of objects.

6) The Development of Objects in Relation to Schemes

Reflexes, simple undifferentiated schemes, differentiated schemes, dropping and throwing objects, socially instigated schemes.

B) Piaget's Stages (levels) of Development,

From Hogg and Sebba, 1986

There are three main levels which are divided into six stages, two levels at each stage

Primary circular reactions, based on reflexive responses leading to schemes that are repeated and generalised;

Secondary circular reactions, leading to the co-ordination of secondary schemes, where learned habits emerge into intelligent behaviour;

Tertiary circular reactions, leading to the invention of new means through mental combinations with trial and error and dependence upon feedback as a basis for new learning.

C) The adaptation of the above approach to thinking means that we have six strands of learning i.e.

- 1) *The Development of visual pursuit and the Permanence of Objects*
- 2) *Means of Obtaining Desired Environmental Events*
- 3) *The Development of a) vocal and b) Gestural Imitation*
- 4) *The Development of Operational Causality*
- 5) Construction of Object Relations in Space
- 6) The Development of Objects in Relation to Schemes

Within each of these strands at Level One, there are a further three sub levels each of which is divided into two further levels. This makes a total of six sub levels in total

Sub-attainment level 1i

- 1, 2, 4. Student encounters activities and experiences. Student follows a slow moving object. Student watches their hand when it moves.
- 3a. Student makes sounds when not distressed.
- 3b. Student shows interest in adults.
5. Student turns head in direction of familiar adult on hearing or seeing them.
6. Student touches an object.

Sub-attainment level 1ii

1. Pupils show emerging awareness of activities and experiences. Student notices the disappearance of a slowly moving objects.
2. They may have periods when they appear alert and ready to focus their attention on certain people, events, objects or parts of objects, student grasps an object visually directing his hand to the object.
- 3a student responds to infant like sounds.
- 3b student attempts to imitate action but does not succeed
4. student repeats arm actions to keep an object active consistently
5. is able to localize the source of a sound visually
- 6 They may give intermittent reactions, student interacts with several objects at the same time by taking them to their mouth.

Sub-attainment level 2i

1. They begin to show interest in people, events and objects. Student pulls off a screen to obtain an object.

2. Pupil's begin to respond consistently to familiar people, events and objects. Student repeats an action moving their hands systematically to produce an interesting event.

3a student vocalizes similar sounds to adults

3b student imitates a familiar gesture immediately

4. They accept and engage in coactive exploration. Student produces a dominant act during a pause to suggest a procedure.

5. They react to new activities and experiences⁵ student follows a rapidly moving object and locates it visually only when it lands into views.

6. Student interacts with several objects at the same time by visual inspection

Sub-attainment level 2ii

1 student finds an object completely covered in three places and searches directly under the correct screen.

2. Student begins to be proactive in their interactions. Student moves the body to regain an object and continues to play with it.

3a student imitates familiar words

3b student models unfamiliar gestures immediately.

4.They cooperate with shared exploration and supported participation, for example, in a familiar game the student responds during pauses.

5.They perform actions, often by trial and improvement, and they remember learned responses over short periods of time, for example, student drops objects into a container and reverses it to get it out

6.student bangs two objects together

7.They communicate consistent preferences and affective responses, for example, showing a consistent dislike for certain flavours or textures.

Sub-attainment level 3i

1. They sustain concentration for short periods. Student finds an object under three super imposed screen.

2. They remember learned responses over more extended periods. Student understands the relationship of a support and reaches for a object

3a student imitate unfamiliar sounds but not in a similar way.

3b student attempts to imitate unfamiliar actions they can see.

4. They participate in shared activities with less support. Student attempts to suggest a procedure to create a new event of interest to them

5. They observe the results of their own actions with interest. Student acts a place with objects appreciating the force of gravity
6. They explore materials in increasingly complex ways, Student shows more varied actions adapted to specific objects such as swinging objects
7. Pupils begin to communicate intentionally; They seek attention; they request events or activities

Sub-attainment level 3ii

1. Searches to find an object under the correct one of three screens.
2. They apply potential solutions systematically to problems, for example, tipping a container in order to pour out its contents.
- 3a.b. Pupils use emerging conventional communication. They vocalize sounds similar to models immediately and imitate at least one invisible gestures immediately
4. Attempt to activate an object by giving it back to the adult. They can remember learned responses over increasing periods of time e.g. uses a stick to get an object without demonstration.
5. Pupils may anticipate known events, for example, drops several objects repeatedly to see where they land.
6. They actively explore objects and events for more extended periods, for example, feeling the textures of different parts of a plant.

When another person is present, a student will show objects to encourage social interaction.

7. They may respond to options and choices with actions or gestures, for example, touching one substance rather than another.

These levels form the bases of the learning outcomes that are being developed at attainment Level One within the Maltese curriculum. At this level of teaching the access is on the six strands of learning and the national curriculum forms the learning context and environment within which the students can learn. So for examples the students may not be learning Science but in terms of cause and effect when ice-cream melts on their body then in scientific terms materials are changing their properties from solids to liquids.

The application of this approach is particularly relevant in the teaching of mathematics at attainment Level One.

