

Federal Democratic Republic of Ethiopia
Ministry of Education

Curriculum Framework
for Ethiopian Education
(KG – Grade 12)

May 2009

Acronyms and Abbreviations

EFA	Education for All
GECFDD	General Education Curriculum Framework Development Department
GIS	Geographical information system
ICDR	Institute for Curriculum Development and Research
ICT	Information Communications Technology
IT	Information Technology
KG	Kindergarten
MDGs	Millennium Development Goals
MLC	Minimum Learning Competencies
MoE	Ministry of Education
PLWHA	People living with HIV/Aids
REB	Regional Education Bureau
TVET	Technical and Vocational Education Training

Message from the Minister of Education

Education and development are closely related endeavours. This is the main reason why we always say Education is the key instrument in Ethiopia's development. The world is being changed at a steady pace in all aspects. The change is quite conspicuous in the area of education particularly in information and communication albeit educational change has never been easy. The fast and globalised world we are in entails new knowledge, skills, attitudes and values from the part of the individual. It is therefore with this objective in view that the curriculum, which is a reflection of a given country's education system, must be responsive to these changing conditions.

It has now been fifteen years since Ethiopia launched and implemented the incumbent Education and Training Policy. Since then our country has achieved remarkable progress in terms of access, equity and relevance. Vigorous efforts also have been made to improve the quality of education in the country. Following the implementation of the Education and Training Policy, several and cautious appraisals have been carried out on the existing curriculum. The analyses and results of these appraisals have shown that there were problems on the different aspects of our curriculum especially in the areas of education materials, methodologies and assessment techniques. It was found out that these factors were mainly attributed to the steady increase in the dropout rates particularly in the rural areas of the country.

To address issues related to our education system, the Ministry of Education has developed a Framework for Curriculum Development. The framework covers pre-primary, primary, general secondary and preparatory levels of education. It aims to reinforce the basic tenets and principles outlined in the Education and Training Policy. Subsequent curriculum materials development is based upon Active Learning methods and Competency-based approach.

The Framework clearly defines the learners' competency at all levels in relation to knowledge, understanding and skills; promotes understanding of cultures within nations and nationalities in the country. It encourages gender equality, infuses HIV prevention and care issues within the curricula. It creates opportunity for the use of IT and the education of ICT in the teaching and learning process. It also incorporates population and environmental matters at the various grade levels and considers learners with special learning needs, civics and ethical values. The framework places a more active role to the learner rather than to the teacher.

Preparation of a framework document is not an end on its own. It rather calls for the joint efforts of all the stakeholders for genuine implementation. Thus in implementing the strategies, the teacher's role must be a more flexible one ranging from a lecturer to a motivator, guide and facilitator. To actualise this, teachers need orientation / training on new teaching methods. Thus to meet these requirements our government has been taking different radical and valuable measures from the very beginning and will continue to do in more consolidated way in the future too.

I believe that this framework document is a blue print. It will provide guidance for the preparation of the subsequent curriculum materials notably syllabi, textbooks and also for the overall implementation of the teaching learning activities across the grade levels.

Thank you very much!

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Introduction

The existing curriculum in Ethiopia is based on the objectives of the Education and Training Policy of 1994. This policy stressed the need for relevance and for account to be taken of the profile of students. It also emphasised the importance in writing the curriculum and in developing the textbooks following sound pedagogical and psychological principles, and taking into consideration international standards and local conditions.

The curriculum has been revised once since its implementation 14 years ago. This revision, between 2003 and 2005, mainly focused on re-arranging the content and including current issues of concern such as civics and ethical education, gender, HIV/AIDS education, and other government policies and strategies.

However, analysis of research carried out by the General Education Curriculum Framework Development Department (GECFDD, formerly ICDR) indicates that there are major drawbacks in the present curriculum, notably a lack of relevance of some of the content, problems in the assumed methodology of teaching, as well as difficulties in the implementation of continuous assessment. The findings of the research also indicates that contents of textbooks, which follow the subject syllabuses in the curriculum are highly overloaded and often conceptually too advanced. Moreover, although the policy advocates a student-centred approach, the teaching learning materials do not promote this method. This Framework outlines ways to address these deficiencies, based upon international good practice in terms of curriculum design and teaching methodology.

For our curriculum to address effectively the needs of both society and the individual and bearing in mind the crucial issues of poverty reduction and sustainable development strategies, Education for All (EFA) and Millennium Development Goals (MDGs), a major revision was felt to be necessary.

More children than ever before in Ethiopia have access to education, and knowledge and understanding must be made accessible to them. This means that what and how they learn needs to be approached in a way that allows children from all backgrounds and with different abilities to develop as fully as possible and achieve to the best of their ability.

Traditional teaching methods such as rote-learning and memorisation have their uses and may enable some students to pass exams and gain certificates, but they do not necessarily lead to understanding and the ability to apply knowledge successfully to meet the challenges of modern society. Research suggests that memory improves with understanding and that to remember something for a long time one needs to give it meaning. The greater the number and complexity of things to remember, the greater the need to have meaning. A successful curriculum achieves a balance between theory and practice, and encourages the use of a variety of teaching and learning methodologies so that different learning styles are accommodated and learners are given opportunities to consider, verify and practice what they learn in order to give it maximum meaning.

This Curriculum Framework adopts the principles of Active learning and a competency-based approach to education as the most flexible means to achieve the desired changes.

Research indicates that children learn best when they are actively involved in the learning process through participation, contribution and production. Key words for active learning are: *doing, observing, dialogue*.

Doing refers to learning activities where the student actually does something: e.g. conducting experiments, conducting investigations and interviews, discussion or debate, role playing and simulation activities and case studies.

Observing occurs when the student watches or listens to someone else doing something: e.g. the teacher giving a demonstration or an example, a film about agriculture, a visit to a factory. Reading is also a form of observing: e.g. reading a story about illness.

Dialogue implies an interactive exchange. This can be with others: e.g. the teacher, small discussion groups, visiting experts and letters or emails. It can also be with oneself (reflective thinking): e.g. asking yourself what you feel or think or have understood about what you are learning or what you still need to find out about it.

Modern teaching methods recognise that there is a need to give students the chance to think about what they are being taught or what they are learning. This means that it is essential that teachers do not spend whole lessons talking, but plan in opportunities for class discussions in which students can exchange ideas, resolve misunderstandings and make sense out of what they are listening to, or engage in a variety of different activities which give them the opportunity to construct meaning for themselves out of the information they are receiving. This approach is based on the constructivist theory of teaching and learning, which underpins the concept of competency-based education.

In this Framework, competency is taken as the capacity of learners' to apply knowledge, skills, attitudes and values in independent, practical and meaningful ways. Modern teaching and learning approaches emphasise the development of students' competencies in all curriculum areas. Each competency is the outcome, or result, of a specific learning experience or set of learning experiences. The outcome itself is an overall competency made up of one or more contributing competencies.

Competencies describe the genuine abilities of students to demonstrate that they have understood the concepts and have developed the required skills and values. Competencies emphasise the transfer of learning. When a student is competent in a particular area of learning, he/she has not only mastered the ability to carry out an action but also knows why he/she is doing that action and when to employ it.

Using this approach, students should become more active participants in their own learning through exploring, observing, experimenting and practicing rather than simply being passive receivers of knowledge. This Curriculum Framework aims to encourage flexibility in teaching and learning methodologies and strategies and will require a shift in teachers' thinking to enable them to include a variety of more appropriate activities to enhance students' participation in their learning.

Current theories of multiple intelligences state that different children may learn better through different modalities – visual, auditory or kinesthetic. For example: students with a strong visual memory might learn best from pictures, those with a better auditory memory from listening and talking, and those with a strong kinesthetic memory might learn better by

physically interacting with the information they are presented with. This theory provides a theoretical underpinning for using a wide variety of methods for teaching.

However, cognitive scientists believe that since most memories are stored as meaning rather than in terms of whether you saw, heard or interacted physically with the information, teachers should focus on the best modality for presenting the content rather than on the students' varied best modalities for learning. Students with good auditory memory may be able to learn the correct pronunciation of foreign languages quicker than others. Those with stronger visual memory may be better at visual tasks: e.g. memorising where countries are on a map of the world, and those with good kinesthetic memory may be better at sport or quicker to develop good handwriting. But most of what students are expected to learn is based on meaning and, however the information is presented, the student must extract meaning from it.

Thus, if the teacher wants students to remember what something looks like, the presentation should be visual rather than a verbal description. Similarly, a science experiment should be physically conducted, ideally by the students in groups, rather than read about or given as a lecture. Many topics may require a range of information presented in a variety of modalities. For example: a Social Studies unit on war could demand reading, listening to lectures from the teacher or a visiting speaker, watching a film, visiting a battle site or museum, looking at maps or old pictures, interviewing old soldiers, making models of weapons, and so on.

The way in which information is presented can influence the effectiveness of a given lesson for all students in the class. The teacher's aim should be to present the information in the most appropriate and effective way possible. The modality matters in the same way for all students, regardless of their own preferred learning styles. Whichever of the two schools of thought the teacher prefers, there is the same need to use a variety of modes of presentation and activity.

The new Curriculum Framework for Ethiopian kindergarten, primary (Grades 1–8), general secondary (Grades 9 and 10) and preparatory (Grades 11 and 12) levels follows the above principles and has been prepared considering international best practice. The principles will serve as guides in the subsequent development of curriculum materials across all grade levels.

This Framework consists of the following major parts: the vision, principles of curriculum, key competencies, overarching issues, re-primary education curriculum, primary education curriculum, secondary education curriculum, and assessment and promotion.

1. Vision

Education has a vital role to play in Ethiopia. It provides the young people of Ethiopia with the competencies, which they need to undertake further study and to take their place within the working community. It is through education that each person is able to realise their full potential in life and contribute to the development of their country.

Education is the key to sustaining Ethiopian development and it is through education that the country will be transformed into a knowledge-based society embracing new technology and using it to solve the problems of today and tomorrow.

Tomorrow's young people in Ethiopia will be:

- literate and numerate
- creative thinkers
- problem solvers
- active innovators
- IT literate
- informed decision makers
- democratic and tolerant
- able to adapt to a changing world.

They will also be members of a well-balanced, productive, responsible and accountable society, which will adapt to change while retaining its cultural diversity and identity.

Our vision in the reformed curriculum, therefore, is to see high-quality education designed and implemented at all levels of formal education in our schools and to create knowledge based society.

2. Principles

The Curriculum Framework for our schools is underpinned by the following key principles. These key principles guide schools in whole-school planning and curriculum development.

- **Respect cultural heritage and diversity**
Ethiopia has diverse cultures that all contribute to the colourful tapestry, which is our country. Young people will be educated in a way that respects this diversity while unifying them into one country.
- **Provide equal opportunity**
All young people, no matter what their religion, gender, ethnic group or physical and mental ability will be provided with equal opportunities within the curriculum to fulfil their potential.
- **Provide learning skills**
All young people will be educated in a way that provides high-level learning skills, and particularly high-level skills, in order to promote critical thinking and problem solving.
- **Use new technology**
Students will be encouraged, within their education, to appreciate and apply new technology and consider how it can benefit society.
- **Promote active participation**
Young people will be encouraged to take an active part in their own education and to look for information from many different sources.
- **Relevance**
The curriculum content should be related to everyday life so that all students appreciate both the relevance and the value of their education both to the individual and to their society.

3. Values

Values are beliefs about what is important and what is just. Values guide our actions and our judgements.

The curriculum should encourage students in Ethiopian schools to value:

- their national and international heritage
- unity within the diversity of their country
- respect for themselves and for others
- equality between all sections of society
- work and the efforts of all people working within their society
- excellence by aiming high
- innovation by applying knowledge to solving problems
- their environment and to care for it.

Through their learning experiences students should:

- develop and refer their own set of beneficial values
- understand the value of their culture and their heritage
- respect the values of other people and other cultures
- understand the value of education as a means of progressing both as an individual and as a country.

4. Key Competencies

Key competencies are abilities and skills that students need to live, learn, work and contribute both to their own community and to their country.

The Ethiopian curriculum identifies the following key competencies:

- life skills
- base-line skills
- higher-order skills
- participation and contribution
- independence
- adapting to change
- time management

4.1 Life skills

Students should learn to communicate and interact effectively with a diverse range of people. They should have the ability to listen actively, recognise different points of view, negotiate and share ideas.

Students should value themselves as members of society and develop self-confidence as a result of hard work and achievement.

Students should be able to organise their own lives, make informed decision and be responsible for their own actions.

4.2 Base-line skills

All students should at least attain a level of education, which allows them to participate actively within the society in which they live.

Students should be sufficiently literate to be aware of the issues within their society by assimilating different sources of information. They should be sufficiently numerate to carry out everyday transactions and understand numeric information. They will be equipped with basic scientific and technological skills.

4.3 Higher-order skills

The curriculum should be taught in a way that engenders and promotes the development of application of knowledge, analysis, synthesis, evaluation and innovation.

Students should develop critical thinking and creative thinking skills in the context of solving problems.

4.4 Participation and contribution

Students should display a positive attitude towards their own education by showing a willingness to play an active role and contribute in lessons and practical activities.

Students should be encouraged to participate and contribute fully within both the school and the wider community in projects, which benefit both themselves and their community.

4.5 Independence

Students should be taught to be self-motivated, setting their own high standards and goals initially within their education, and later in their working life. This is about individual students knowing who they are, where they come from and where they are going.

Students should devise their own strategies for meeting challenges, and how and when to follow someone's lead or make their own well-informed choices.

Education should engender a spirit of free enterprise and encourage students to be ambitious within what is attainable.

4.6 Adapting to change

Education should make students perpetual learners. They should be receptive to changes which affect their lives positively and ready to look for ways of benefiting from them.

4.7 Time management

Students should be taught time management, which includes tools or techniques for planning and scheduling time, usually with the aim to increase effectiveness and/or efficiency.

5. Overarching Issues

In designing the syllabus for a subject, the following must be taken into account.

- 5.1 The existing curriculum has been criticised on the basis that the syllabuses contain too much to be taught in the time available. This problem has been made more acute by the reduction in the number of periods allocated to some subjects each week. A revised syllabus must show an appropriate reduction in content.
- 5.2 The existing curriculum has also been criticised on the basis that, in some subjects, some of the content is too difficult for the grade in which it is to be taught and the overall content is not arranged in order of difficulty both within and across grades. A revised syllabus must address these problems.
- 5.3 The existing curriculum has been criticised as not being sufficiently relevant to the lives and needs of students. It has been suggested that this contributes to the high drop-out rate of students from primary education particularly from rural communities. A revised syllabus must better reflect the needs of students from both rural and urban communities.
- 5.4 The existing curriculum was not thought to give sufficient emphasis to development of values. Each revised subject syllabus must reflect those values. In addition to these values, each subject should identify subject specific skills to be developed. For example: in language the key skills would be speaking, listening, reading and writing.
- 5.5 The existing methodology of teaching has been criticised for the absence of active methods of learning where the students are involved. There are two elements to this: lessons should be well structured, and a wider range of activities should be written into the curriculum.
See Appendix 1 for an example of a lesson structure, and Appendix 2 for some examples of active teaching and learning strategies. These will result in students being more interested and motivated to learn.
- 5.6 The following issues should pervade the syllabus for each subject in appropriate ways:
 - **Learner competencies:** should be clearly defined at all levels and should show clear progression from year to year based upon international practice and understanding of students' cognitive development. Competencies should be identified in terms of knowledge, understanding and skills
 - **Culture:** syllabi should promote understanding of all cultures within Ethiopia in the context of a diverse but unified country.
 - **Gender:** syllabi should show no gender bias and promote gender equality
 - **HIV:** opportunities should be taken within syllabi to highlight issues relating to HIV such as responsible sexual behaviour and showing love and care for PLWHA
 - Students will be encouraged to use their IT skills in any subject where it is appropriate
 - **Information Communications Technology:** syllabi should indicate where and how ICT could be used within the curriculum. However, this should be tempered with a realistic appreciation of what will be available in schools
 - **Population and environment:** syllabi should highlight issues relating to population and environment such as the problems of rapid population growth, family planning, environmental degradation, conservation of resources and pollution
 - **Learners with special learning needs**
 - **Civic and ethical values**

6. Kindergarten

Kindergarten (KG) education focuses on the all-round development of children encouraging their curiosity to learn and helping them to make sense of the world around them in preparation for a full life both in and out of school (life skills and educational).

Although children aged 4–6 are at a similar stage of cognitive development (pre-operational stage), slight cognitive differences appear among them. Therefore the pre-primary education curriculum has two stages:

Stage 1: 4–5 years

Stage 2: 5–6 years

Children learn much from each other – especially from those just older and more experienced than themselves. It is therefore important for the age groups to mix, spending time together in both independent and facilitated play.

Goal

The goal of kindergarten education is to help children develop their emotional, cognitive, physical and social domains, thus encouraging their ability and enthusiasm to continue to learn in both informal and formal environments and develop their social and educational skills.

Approaches to kindergarten education

Kindergarten education uses a child-centred approach where children can learn through play in an informal environment at their own pace. Free play encourages the child to engage in learning voluntarily, experimenting and making their own discoveries both independently or with other children and adults. This contributes to the formation of their identity, expression and social learning.

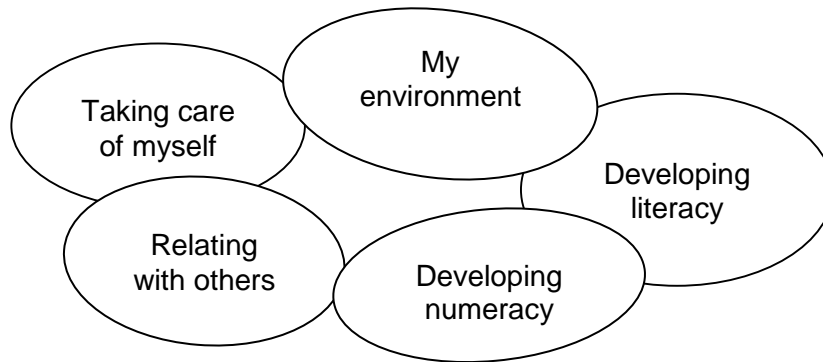
Adults can develop the work in line with the children's needs and level of understanding. All children learn differently at different speeds so adults need to be sympathetic to each child's interests and needs, considering each child individually and avoiding a blanket approach.

Children do not compartmentalise their learning. Their learning and experimentation is integrated and adults must understand the rich opportunities for learning many areas of the curriculum within one activity. For example: science, mathematics, narrative and social skills may be learnt during a creative arts project as well as the art and motor skills. Children need to experience the relevance of their world before they separate themselves from it and begin to analyse it in a detached way.

Specific approaches

- Learning through free and facilitated play – such as sports, dance, music, visual arts and role-play.
- Using mother tongue as a medium of instruction and for storytelling.
- Using hands-on activities with a creative approach. Facilitating open-ended projects with a focus on the process rather than final product thus allowing the child to experiment and discover independently.
- For children to learn and communicate through all their senses including physical, sensory, sound and visual.
- Teaching an integrated curriculum where all areas of learning are learnt together.

The integrated kindergarten curriculum consists of the following learning areas:



This grouping has been done to facilitate the understanding of various activities the child needs to do during this period. However, it does not represent any strict compartmentalisation of activities. This means the activities are interrelated in nature. As a result, the activities in one group influence the outcome of activities in another group and sometimes form the basis for progression of skills in the other group.

Relating with others

Children need to have relationships and feel a sense of belonging. They also need to understand feelings of others by relating them to their own. To enhance this, they need experience by observing people, interacting with them; and discovering relationships in the family, the immediate community and different services in the community. The learning activities should facilitate all rounded development, attitudes, values and skills.

Taking care of myself

Children need to explore themselves: i.e. their body parts, their self-concept, confidence and self-esteem and express themselves freely and independently. They also need to be able to keep themselves safe and avoid accidents. The learning activities should facilitate proper growth and development.

My environment

Children are curious by nature. They are always eager to know more about their environment. This learning area encourages children to understand themselves and their immediate natural and social environment. It helps children to develop a sense of enquiry, life skills, an understanding of simple scientific concepts and social values. Children will be introduced to developing awareness, interest and appreciation of their surroundings and utilising skills of observing, classifying and comparing. They also practice citizenship skills through participation in-group activities and explore the relationship of home, school and community.

Developing literacy

Learning mother tongue encourages children to develop basic communicative skills, life skills and social values. Mother tongue is used for spoken communication and interaction between children and with adults at this level. Through a variety of learning styles and teaching methods children will be learning letters, key words and sounds, listening and responding to stories and oral communications. When they are ready, they can begin to apply this in reading simple sentences.

Learning English language encourages the early development of basic communicative skills in young children. The experience of learning a new language can be a positive, enjoyable and fun activity. Children can be learning basic words and sounds. The curriculum should

focus mainly on listening and speaking through simple verses and play. There can be opportunity for writing and reading skills if, and when, children are ready.

Developing numeracy

Mathematics helps students to develop the concept of direction, space, quantity, size and number. Children will be learning to sort and classify object, to identify common objects around them and to describe their geometric features and positions.

Timetable

The timetable for the KG covers 30 weeks in a year, 5 days a week, and 25 periods per week. One period will have 30 minutes duration. There is room to make the duration flexible based on the needs of children, the environment and educational factors.

7. Structure of Primary and Secondary Curriculum

There is a general belief that an educated person should develop the following knowledge and skills.

- **Language skills** including:
 - literacy in the mother tongue as a minimum, because it is generally accepted that children acquire literacy easily if literacy is based on their mother tongue.
 - knowledge of a federal working language and an international language.
- **Mathematical knowledge**
- **Scientific and technical knowledge and skills** that can often be linked to work, training and earning a living
- **Self-knowledge and self-understanding** that is mainly knowledge, which enables people to operate effectively within their society
- **Knowledge about, people and one's society**
- **Knowledge and skills related to one's physical well-being**
- **Cultural knowledge**-including the arts, music, dance etc.
- **Health and environmental education**
- **Civic and ethical values**

7.1 Primary Education

Goals

The Goals of Primary Education are:

- to provide basic education, which is appropriate to the physical and cognitive development of the learners;
- to acquaint the learners with the production and service giving activities within their immediate environment;
- To provide general education that prepares the learners for further education and training and for the world of work; by equipping them with basic knowledge, skills and abilities and attitudes.

Subjects offered at the Primary education level

Learning areas are broad groupings of knowledge and skills. In the primary curriculum there are five such areas: aesthetics, languages, mathematics, natural sciences and social sciences.

Subjects offered in Grades 1–4:

Arts and Physical Education	Amharic
Mother Tongue	English
Mathematics	Environmental Science

Subjects offered in Grades 5 and 6:

Civics and Ethical Education	Physical Education
Visual Arts and Music	Amharic
Mother Tongue	English
Mathematics	Integrated Science

Subjects offered in Grades 7 and 8:

Civics and Ethical Education	Mother Tongue
Visual Arts and Music	Amharic
Physical Education	English

Mathematics
Biology
Chemistry
Physics

Social Studies

7.1.1 Learning areas

Arts and Physical Education

What are the Arts about?

The Arts are concerned with sensory emotional values and with expressing ideas in different ways. Arts can be divided into several areas including visual arts, sound arts (music), dance and drama.

How is the Arts area structured?

In Grades 1 to 4 the Arts are taught in combination with Physical Education since some branches of arts, such as dance, are related to the way in which we use our bodies.

In Grades 5 and 6, Visual Arts and Music are taught as separate subjects while Physical Education is taught as a separate subject throughout Grades 5 to 8.

Visual Arts

These are art forms that focus on the creation of works, which are primarily visual in nature. Work such as painting, sculpture, handicrafts, photography, print making and film making can be included in Visual Arts.

Music

Students are introduced to different types of traditional music. This enables young students to develop an appreciation of their and other cultures and traditions. It is the intention to produce a young generation that develops a general appreciation of all kinds of music.

Physical Education

The aim of including this subject within the curriculum is to produce physically healthy students. Some of the time is given to team games, which allow students to develop the skills needed to work with and cooperate with others. The competition, which is inherent in many sports and games, provides students with opportunities to demonstrate achievement, which increases self-esteem and self-confidence.

Languages

What are languages about?

Language is a social phenomenon. Languages mirror the culture of the societies and of the speakers who use them. Languages are about communication and are the means by which we deliver education to students. Languages allow students to gain information and experience; and exchange views, ideas, and different cultural and social values.

How is the language area structured?

Students begin learning their mother tongue from birth and mother tongue is formally given beginning from Grade 1. They begin learning English in Grade 1. In Grade 3, they also begin to learn Amharic and the teaching of all three languages continues through to Grade 8.

Mother tongue

The study of mother tongue should start in Grade 1. The benefits of this are:

- it will immediately be used as a medium of instruction for all nationalities
- it facilitates the learning of other languages
- from a pedagogical point of view, a student can learn other subjects in depth within a short period of time
- the mother tongue can facilitate the students' learning ability, understanding and cognitive development
- the mother tongue teacher can impart the subject matters in depth and breadth within a limited time
- if students learn in their mother tongue, they can develop self-reliance and psychological motivation and retain social and cultural values
- if nations and nationalities use their languages in education, they will have the advantage of promoting their cultures and retain self-identity.

Research shows that children who learn in their mother tongue before reaching the age of 10 years are able to use the learning techniques to benefit the learning of second language.

Amharic as federal working language

For many political and historical reasons, Amharic serves as the Federal working language of the country. It also serves as a *lingua franca* for business, commerce and government. It formerly served as a medium of instruction in primary schools throughout the country.

Based on the current education policy, primary education is given in the mother tongue for all nations and nationalities. Amharic is also taught as a second language to all students for whom it is not their mother tongue.

For those students for whom Amharic is not their mother tongue, it begins in Grade 3 so, by the time learners finish the first cycle, they will have had two years of instruction in Amharic. This will help them to expand their knowledge of the language. In addition, they will have some basic knowledge to communicate with other regions by using Amharic as a *lingua franca*.

It is appropriate to start learning Amharic from Grade 3 because:

- Students begin to study English in Grade 1. If Amharic was also started in Grade 1, it would be too great a burden for students.
- Amharic is already familiar in many regions of the country, so many students may already have developed the speaking and listening skills at a young age making it easier to start formal learning at Grade 3.

English

As a result of the expansion of economic and political relations among the nations of the world, there is a need for common means of communication, which is met by the English language. English has become the medium of international communication for a variety of reasons. Within the context of education, there is an enormous reservoir of educational materials in all fields available in English. These provide an invaluable aid for education, particularly in relation to advancing industrial diversification and technology.

If Ethiopia is to develop an industry based on modern technology and to keep abreast of the advances made in science and technology, English must be taught in the Ethiopian educational system. The benefits of this are:

- it is the language of wider communication

- it is well-developed at the international level and is the language of science and technology, commerce, trade and politics.
- it has been the language of international relations and the medium of instruction for secondary and higher education for a long time in Ethiopia.

Mathematics

What is Mathematics about?

Mathematics is about relationships of numbers, measurement, shapes and solids and data handling. It is a useful tool whereby students actively acquire knowledge through doing and problem solving in relation to the challenges faced in their day-to-day lives.

It is a discipline where students are provided with opportunities to obtain knowledge through thinking and reasoning and are also guided in how to use their acquired knowledge to make sense of the world around them.

How is the Mathematics area structured?

Mathematics is taught throughout the whole of Grades 1–8. The key mathematical concepts considered in the primary school Mathematics curriculum can be classified under the following areas.

Numbers and operations with numbers: the number system is introduced step by step and the ability of students to order and perform fundamental operations on numbers is developed.

Sets: the concept of sets is treated spirally right from early definitions to the development of students' abilities in operating with sets and using variables to describe sets.

Equations and inequalities: the competencies in solving linear equations and inequalities in a given domain are developed step-by-step up to the stage where students are able to solve simple word problems leading to linear equations and inequalities.

Ratios, proportions and percentages: students are encouraged and assisted to define and apply the concepts of direct and inverse proportionality, ratios and percentages and apply their knowledge in solving real-life problems.

Graphs, relations and functions: the students' ability to collect, present and interpret data in a pictorial way is gradually developed. The notions of relations and functions are introduced and gradually developed by applying the concepts learnt in solving relevant and real-life problems.

Measurements: the students' ability in measuring is developed right from measuring the length of line segments to the stage where they are able to compute the volumes of various solid objects.

Geometry: students define measure and classify angles, triangles, quadrilaterals and circles. From this, they develop basic skills of geometric construction. They identify common solids and their properties.

Natural Sciences

What are natural sciences about?

Natural sciences can be perceived as a body of knowledge that has been built up by scientific enquiry and experiment. Students benefit from developing scientific knowledge, understanding and skills in a number of ways. They will have a:

- better understanding of the physical and biological world around them
- fuller appreciation of how to lead a healthy lifestyle
- good grounding for studying science at higher levels and/or working in scientific and technical careers.

How is the natural sciences area structured?

In Grades 1–4, natural sciences are taught in an integrated form together with social science and this is collectively called Environmental Science. In Grades 5 and 6, the natural sciences are taught together as integrated science while in Grades 7 and 8 they are taught as separate sciences. The key skills of natural science are identified as observation, measurement, experimentation and the collection, interpretation and recording of data.

Environmental Science

Environmental science is an integrated subject comprising strands of natural sciences, health, agriculture, social sciences, home science and Civics Education.

At this stage of their development, students perceive their environment in an integrated way and not as a collection of separate subjects. It is thus appropriate to deal with topics in this way in order to provide a whole picture of the natural world. Integration enables students to organise their knowledge in ways that are meaningful to them.

Integrated Science

Integrated science, as the name suggests, is an integrated subject in which aspects of the separate sciences – Biology, Chemistry and Physics – are brought together. This is frequently done around applied science themes, such as agriculture and health.

The integrated science curriculum for Grades 5 and 6 is structured by a thematic approach and adopts six themes, which are studied at both grades. The themes are Air, Water, Plants, Animals, Our Body and Earth. The themes are considered at both grades in such a way that they address important issues like HIV and AIDS, harmful traditional practices, rural development, health, agriculture and environment. Themes are presented in such a way as to provide students with opportunities to learn science by doing, and to develop scientific knowledge and skills as well as the attitudes and values needed for effective citizenry.

Separate sciences

In the separate sciences in Grades 7 and 8, topics would again benefit from themes in which scientific concepts are related to everyday life to make them as meaningful as possible to students.

Biology

Biology is a life science that allows students to acquire knowledge and understanding about themselves and the organisms in their environment. It allows students to appreciate the harmony, contrast and beauty of nature around them. Biology as an experimental science involves critical thinking, reasoning and problem solving in everyday contexts.

In Grades 7 and 8, students will begin with an elementary overview of basic issues in Biology. Stress is placed on the need for biological knowledge in understanding issues affecting people as individuals and the interaction of people both with society and with the natural environment. Subsequent topics provide opportunities for problem solving involving individuals and populations by integrating issues that are related to the environment, population, health, agriculture and disasters. Observations, field trips and direct study of natural habitats acquaint students with nature, while developing positive attitudes towards them and towards active participation in conservation of nature and other community undertakings.

Chemistry

Chemistry is the study of the structure of matter and the changes it undergoes in natural processes and in planned experiments. Through Chemistry, we become familiar with the composition and uses of inanimate materials – both natural and artificial – and with the vital process of living things, including our bodies. Chemistry contributes too many aspects of everyday life including food, textiles, drugs, metals, plastics, rubbers, soaps, detergents, paints, dyes, fertilizers and insecticides.

Chemistry starts to be given as a subject in Grade 7. As beginners, students start studying meaning and importance of Chemistry. This enables them to justify why they study Chemistry. The students continue learning properties and changes of substances in their environment. To have competency of chemical communication, students will study chemical shorthand like symbols, formulas and units, and their qualitative and quantitative meanings. The students then are provided introduction to structure of substances and periodic classification of the elements to lead them to answer the question why one substance has different properties from the other substances.

In Grade 8, students will study classification of compounds into major groups and learn their general properties. In this grade, students also learn occurrence, important ores and uses of some common and selected metals and non-metals. As Chemistry is also concerned with the economical uses of resources, students study environmental Chemistry. Here they study natural resources like air, water, soil and fuels in the aspects of some general properties, compositions, uses, pollution and its prevention. Finally at the end of Grade 8, students study quantitative relationships in chemical symbols and formulas.

Physics

Physics is the study of matter and energy. It is mankind's attempt to obtain a better understanding of the physical world (non-living). Like all other sciences, Physics starts with observation and experiments (usually involving measurements) and designed to obtain facts. Physics is inextricably part of our modern way of thinking and living.

The core of the study of Physics is discovery of scientific truths in the form of physical laws. Physics is a science dealing with the most general properties and forms of motion of matter. The laws of Physics are established by generalising experimental facts. They express the objective regularities existing in nature. The fundamental method of investigation in Physics is the running of experiments, i.e. the observation of the phenomenon being studied in accurately controlled conditions.

Learning Physics, just as learning any skill, requires regular practice of the basic techniques. Students at this level should be given exercises, which are nearly qualitative rather than quantitative, asked to draw pictures, interpret graphs, write short explanations or provide

other answers that do not involve significant calculations. The purpose is to help them develop the basic thinking tools they will need later for quantitative problem solving. As they work their way through, they will find that Physics is a way of thinking about how the world works and why things happen as they do.

The aim of the Grades 7 and 8 Physics curriculum is to help students to have well-built foundation, which their future learning of Physics will be built upon by introducing the basic ideas and principles of Physics. The topics in Grades 7 and 8 are very important because other branches of Physics almost always refer back to aspects of it. By actively participating in the teaching–learning process, students will be able to understand the nature of Physics, apply principles and develop basic manipulative skills associated with Physics.

The activities included in the curriculum help students to develop their experimental skills. Most of the activities can be performed using locally available materials. Some require equipment found in a typical science lab. The activities provide meaningful interactions between students and their world in a manner encouraging sound scientific reasoning. These activities, coupled with the explanations of the underlying concepts, show that Physics is composed of two dimensions – content and process.

The Physics curriculum, with its emphasis of attaining the required profiles, attempts to make the subject relevant to the needs of the society. It will help students to acquire knowledge and understanding of basic Physics concepts and the applications and relevance of these to their everyday lives.

Social Sciences

What are social sciences about?

Social sciences are the integrated study of social studies and humanities to promote civic competence. In the Ethiopian school program, social studies is provided as an integrated subject and a systematic study drawing elements from subjects (disciplines) including geography, history, economics, business, law, political science, sociology and appropriate content from natural sciences.

The arrangement is thematic giving attention to culture, time continuity and change, people and their environments, groups and institutions, governance, production, distribution and consumption, and civic ideals and practices.

Social Studies

In Grades 5–8, the social sciences are taught as social studies, a subject that combines geography and history and elements of other disciplines such as environment, anthropology, sociology and economics.

Social Studies aim to develop responsive students capable of critical thinking and appreciating different points of view on local, national and international issues. It also encourages social participation and fulfils intellectual, personal and societal needs.

Civics and Ethical Education

Civics and Ethical Education is an education for democratic self-government. Self-government means that citizens are actively involved in their own governance. They do not passively accept the dictums of others or acquiesce to the demands of others. The ideals of democracy are most completely realised when citizens share in their own governance. Each

citizen’s participation must be based on informed, critical reflection and in the understanding and acceptance of the rights and responsibilities that go with citizenship.

In the first cycle, civic and ethical issues form part of the integrated content of Environmental Science. At this level, it is appropriate that such issues are taught in the context of an integrated curriculum.

In the second cycle, Civics and Ethical Education is treated as a separate subject. Students are made familiar with the culture and mechanisms of democratic governance and the need for moral and ethical values within society.

By drawing its contents from the various disciplines, the social sciences (e.g. political science, economics philosophy, law, ethics) Civics Education endeavours to enrich the cultural and civic aspects of the learner for both better citizenship and academic preparation for the next cycle.

7.1.2 Timetable

Typically, students will attend school 5 days per week for 39 weeks per year; of these weeks, 34 will be used for classroom activities. The remaining periods will be used for tests, examinations and for offering feedback on the test results and so on. At present each school day is 4 hours divided into 6 periods of 40 minutes giving at total of 30 periods per week.

Grades 1– 4

In allocating time to the different subjects in Grades 1–4, it is the intention to allocate more time to languages, Mathematics and Environmental Science than is currently the case.

Table 1: Number of periods allocated to each subject per week in Grades 1–4, 30 periods/week

Subject		Grades			
		1	2	3	4
1	Amharic			3	3
2	Arts and Physical Education	6	6	4	4
3	English	6	6	5	5
4	Environmental Science	7	7	7	7
5	Mathematics	6	6	6	6
6	Mother Tongue	5	5	5	5
Total periods for the week		30	30	30	30

Grades 5–8

In Grades 5–8, students will study a wider range of subjects. Both Environmental Science and arts are no longer taught in an integrated way, but as a number of discrete subjects.

Table 2: Number of periods allocated to each subject per week in Grades 5–8, 30 periods/week

Subject		Grade			
		5	6	7	8
1	Amharic	3	3	2	2
2	Biology			2	2
3	Chemistry			2	2
4	Civics and Ethical Education	3	3	3	3
5	English	5	5	5	5
6	Integrated Science	4	4		
7	Mathematics	5	5	5	5
8	Mother Tongue	3	3	3	3
9	Visual Arts and Music	2	2	1	1
10	Physical Education	2	2	2	2
11	Physics			3	3
12	Social Studies	3	3	2	2
Total periods for the week		30	30	30	30

Note: In the future, it is hoped to restore the school day to 35 periods. When this becomes the case, the 5 extra periods will be used as follows: *For Grades 5 and 6:* Amharic, English, Maths, Physical Education and Integrated Science will get one more period each. *For Grades 7 and 8:* 1 period for Amharic, 3 for the three sciences and 1 for Physical Education.

The syllabus content of each individual subject should be of a suitable length to be delivered comfortably over 30 periods/week. If, in the future, the school week rises to 35 periods, the extra time will allow teachers to carry out more practical work with students and time to develop higher learning skills. The syllabus content should **not**, under any circumstances, be based on 35 periods/week.

7.2 Secondary Education

Goals

The goals of the first cycle (Grades 9 and 10) of secondary education are to:

- provide general education that will enable the students to identify their needs, interests and potential so that they can choose their field of study;
- enable the student to continue further education and training;
- prepare students for the world of work.

The goals of the second cycle (Grades 11 and 12) of secondary education are:

- choose subjects or areas of training;
- prepare for higher education;
- prepare students for the world of work.

Subjects offered at secondary education level

The following subjects will be offered in Grades 9 and 10:

Mother Tongue	Biology
English	Chemistry
Amharic as second language	Physics
Mathematics	Geography
Information Technology	History
Civics and Ethical Education	Physical Education

The following subjects will be offered in Grades 11 and 12 in two streams.

Table 3: Streaming in Second Cycle Secondary Education (Grades 11 and 12)

Stream	Specialised Courses	Common Courses	Electives
1. Natural Sciences	1. Biology 2. Chemistry 3. Physics 4. Technical Drawing	1. English 2. Civics 3. Physical Education 4. Mathematics 5. ICT	1. Mother Tongue/ Nationality Language <i>or</i> 2. Amharic
2. Social Sciences	1. Geography 2. History 3. Economics 4. General Business		

7.2.1 Learning areas

Languages

Mother Tongue/Nationality Language

In Grades 9 and 10, periods are not allotted for Mother Tongue in the 30-period week. This is because not all regions are ready to offer Mother Tongue as a subject at this level. However, regions that are ready to offer Mother Tongue in Grades 9 and 10 can opt to use two additional periods/week for this subject.

In Grades 11 and 12, Mother Tongue or nationality language is an optional subject. Regions that opt to offer their nationality languages can do so.

Amharic as a federal working language

Amharic as a federal language continues to be offered as a subject from Grade 9 to Grade 12. The distinctions between Amharic as a mother tongue and Amharic as a federal working language ceases to exist. All students will be obliged to take Amharic as a federal working language in Grades 9 and 10. The federal working language is elective for Grades 11 and 12 students.

English language

English serves as a medium of instruction for the secondary education and tertiary education. However, most regions start using English as a medium of instruction from Grade 7, and very few regions from Grade 5. To strengthen the English language proficiency of the students, offering the English language has to be continued to secondary education – both as a subject and medium of instruction.

In Grades 9 and 10, all students begin studying all subjects – Ethiopian languages – through the medium of English. It is therefore crucial that English classes develop students' subject survival skills, confidence and learning strategies. Students will have come to secondary from a range of different schools and backgrounds and will be a more diverse group. Therefore, the focus in Grades 9 and 10 is on revision and extension of what students covered at primary rather than introducing a range of new language items. Topics, texts, vocabulary and activities are more directly linked to other school subjects and reflect the national focus on science and technology.

When students finish general education, most of them will continue to use English, either in Grades 11 and 12, at college, in TVET or in the world of work. For this reason, there is a focus on communication and, through the development of learning strategies, independent learning.

Since the majority of students in Grades 11 and 12 will be aiming for higher education where English continues to be the medium of instruction, the focus of language teaching will be slightly different. Firstly, students need to have a wider range of grammatical and lexical competence to cope with future studies. Secondly, in Grade 11 and especially Grade 12, there is more focus on reading and writing to prepare students for higher education. Thirdly, the focus on longer and more academic texts is also reflected in speaking and listening activities. Discussions and debates are often around topical issues related to other academic subjects. Finally, as has already been demonstrated, there is an increasing focus on students' independence. There is more work on learning strategies.

Mathematics

Mathematics education as a subject will continue to be offered in Grades 9–12 for all students. The objectives of Mathematics for both groups stated for the primary education still serves for secondary school Mathematics.

In Grades 9 and 10, students acquire and develop solid mathematical knowledge, skills and attitudes that significantly contribute to the creation of citizens who are conscious of the social, economic, political and cultural realities of Ethiopia and who can actively and effectively participate in the ongoing process of development of the country. To this end, the following are the objectives of Mathematics learning at this cycle. Students will be able to:

- appreciate the power, elegance and structure of Mathematics
- use Mathematics in their environment and social needs
- understand the essential contribution of Mathematics to areas such as engineering, science, economics and agriculture
- gain mathematical knowledge and skills to enable them pursue with their further education or future vocational trainings.
- gain satisfaction and enjoyment from learning and applying Mathematics
- develop their cognitive, creative and appreciative potential by relating Mathematics with the needs of society
- develop self-confidence in solving mathematical problems.

Mathematics learning in Grades 11 and 12 should aim at promoting the students' abilities in applying subject specific and general mathematical methods of thinking and working, which will contribute to their further development so they are able to serve the needs of society.

In Grades 11 and 12, Mathematics courses will be different for natural science and social science stream students. Mathematics at these grade levels should be used as an important instrument for recognising and describing certain fields of objective reality as well as planning and guiding process of development. Different topics from the history of Mathematics, facts and problems from social practice and other disciplines of science should be discussed and dealt with.

At the end of the second cycle of secondary education, all students should be able to:

- develop a sense of confidence in their reasoning power to solve mathematical problems
- develop mental abilities and high skills in calculations especially in the fields of logical thinking, reasoning, proving, and defining and using mathematical language, terminologies and symbols
- develop an appreciation of the importance of Mathematics as a field of study by learning its historical development, its scope and its relationship with other disciplines.

Information Communications Technology

To avoid any confusion between the two terms Information Communications Technology (ICT) and Information Technology (IT) the following definitions are being used:

ICT: information communications technology is concerned with the full range of computer hardware, computer software, and telecommunications facilities.

IT: information technology is concerned with the knowledge, skills and understanding needed to actually use ICT appropriately.

Just as a person needs to be literate (able to read and write) in order to use books, so a person nowadays, needs to have information technology skills in order to be able to use the various information communications technologies that are available today.

Thus, ICT in Grades 9–12 must have two strands:

- the first is that the students should learn and acquire good, solid IT skills, which will be taught in the ICT lessons.
- the second is to be able to apply and use these skills in their subject areas. Students will be encouraged to use their IT skills in all areas of the curriculum whenever there is the opportunity for the use of ICT to enhance the learning process. The curriculum of all subjects will be revised so that these ICT opportunities are clearly shown. Indeed, there will be occasions for integrated projects across several subjects, which can involve teamwork and research, and show the links between subjects.

Students will begin learning ICT in Grade 9, and continue acquiring skills and understanding how to apply these skills in Grade 10. They will cover the all basic applications packages that they may be expected to use later on, as well as gaining an insight into the basic theoretical aspect of ICT.

In Grades 11 and 12, the ICT will become more specialised, and the curriculum will be adapted to the two streams on offer in the preparatory programs. Students follow either the Social Science stream or the Natural Science stream; both streams will offer ICT.

The main difference between these streams is that whereas some Natural Science students will study computer science/information systems/information technology degrees. Whereas, Social Science students do not enter such courses. Consequently, the IT needs of Social Science students and Natural Science students are different.

Social Science students will look at methods of applying their IT skills as a tool to be used as needed in the subjects they are studying.

Natural Science students will study ICT as a separate subject equal to the other subjects studied in the Science stream, so that they are fully prepared to enter computing degrees if they so wish. The content of their curriculum will focus more on the technical aspects of computing. Throughout these grades, references will be made to moral, ethical and security issues whenever applicable.

Physical Education

Physical Education is that aspect of the general education program that contributes primarily through movement experience in the total physical growth and mental development of each student.

Physical Education is defined as education of, and through movement. It has, as its medium, physical activities. It deals with the body in action, and one of its major aims is the development of better motor control of this instrument for more effective function. Since it provides an opportunity for natural and spontaneous responses in group situations, it makes an important contribution to the social and emotional development of each student.

Physical Education provides students with principles of human well-being. The concept of human well-being is broader than the concept of good health and relates to developing a total life-style that promotes well-being. The programmes are designed to:

- contribute to the development of cardio-respiratory endurance through participation in vigorous physical activities
- promote muscular growth through movements that offer graded resistance
- develop hand-eye and foot-eye coordination rhythm, body mobility, speed, agility, strength and good body mechanics through activities, games and contests, to the end that each student may achieve a high degree of motor control
- develop high standards of fair play, self-discipline, leadership, team spirit and other traits essential to good civic behaviour and good citizenship
- develop an opportunity for social adjustments and the development of emotional control and balance
- provide opportunities for each student to learn healthful recreational activities, which can be used for life time.

In the program, emphasis should be given to the development of interest and skills in outdoor recreational activities so that on leaving school each student is capable of participating in the physical recreation of the community.

At the second cycle of secondary education, Physical Education focuses on promoting physical development and the achievement of personal physical fitness goals, developing competency in a wide variety of physical skills, which allow students to function effectively in physical activities and establishing an understanding of movement and the pertinent principles governing motor-skills performance.

The contents of the subject should enable the students to:

- know how to maintain a satisfactory level of fitness
- possess the adequate skills needed to perform a wide variety of adult recreational activities.

- understand the meaning of movement and serves to introduce, with principle, theories, basic concepts and skills
- lay firm foundations for further studies at the tertiary level.

Areas of focus of the curriculum:

- directed activities
- games, contests and athletics
- rhythmic activities
- cultural sports.

Natural Sciences

The natural sciences – Biology, Chemistry and Physics – in Grades 9–12 will:

- be offered as general education subjects (Grades 9 and 10)
- will be offered as areas of specialisation (Grades 11 and 12)
- prepare learners for tertiary education; make ready for different faculties
- integrate technology
- incorporate elements of the applied sciences of agriculture and productive technology as much as possible
- be supported by practical activities and well equipped laboratories.

Biology

Biology is a life science that allows students to acquire knowledge about themselves and the organisms in their environment. It allows students to appreciate the harmony, contrast and beauty of nature around them. Biology as an experimental science involves critical thinking, reasoning and problem solving in everyday life.

The Biology content of Grades 9 and 10 is, in part, an expanded and deeper look into topics met in Grades 7 and 8 with other new topics also. For a large number of the students, who go on with the subject in Grades 11 and 12, this is a transitional phase towards the continuation of their studies. Biology in Grades 11 and 12 is intended for students who have chosen Biology as a subject at these grade levels. This stage is a preparatory stage, which links secondary level to the tertiary level and, therefore, principles of Biology are taught by bringing the contents forward than the lower grade levels.

The Biology curriculum, at all grade levels, emphasises the relevance of biological knowledge in understanding issues affecting people as individuals and the interaction of people with society and with the environment. Subsequent topics are expanded to applied fields to provide opportunities for problem solving involving individuals and populations by integrating issues that are related to the environment, population, health and safety. With the teaching of the topics proposed in the Biology curriculum, observations and field trips in the vicinity of the school or far from the school as well as direct study of natural habitats are indicated to acquaint the students with nature, while developing positive attitudes towards them and towards active participation in conservation of nature and other community undertakings.

In addition to the use of locally available low cost resources, a biology laboratory equipped with all the necessary equipment and apparatus, chemicals, prepared slides, preserved specimens, charts, models, and a film library is vital for all grade levels because it provides the proper conditions for becoming acquainted with phenomena, investigating them, and conceptualising them. In fact, the teaching-learning process of Biology will make use of participatory approaches such as learning through investigation, laboratory activities, field

visits, the use of films and ICT and life skills activities according to the learning environment required by the material studied and the nature of the classroom population.

Chemistry

Chemistry is not only an experimental science that deals with the composition, structure, properties and changes of substances but also a central science that is applied in life as biochemistry and in the study of physical world as physical chemistry. To win challenges of life, people try to modify or to change materials they are using or to make new substances from the already existing ones. In all these processes and production of goods, drugs, detergents, fertilizers, fibres, plastics and many other construction materials, foodstuffs, household and agricultural equipments and chemicals, Chemistry plays an indispensable role. In this regard, Chemistry is used in the alleviation of poverty at all economic sectors where there are human activities whether it is at home, cottage industry, agriculture or complex factories.

In the first cycle of secondary education, students study more details of what they studied in Grades 7 and 8. In addition, some new topics are delivered at this level.

In Grade 9, students will study the components and characteristics of atoms. They will gain a historical perspective, recognising that much convection that is in use today has been based on the work of previous scientists. This provides them with an important insight into the nature of science. Students will also study periodic classification of elements. Consideration of the properties of some of the elements leads to discussion of the organisation of the periodic table. Patterns in the periodic table are then examined in more detail. Chemical bonding and intermolecular forces, which are essential concepts in Chemistry, are also treated at this grade. The chemical reactions and stoichiometry topics are unified as one unit here. Hence, students simultaneously can develop their concepts of what chemical reactions are, and how the changes they bring about are measured. The importance of chemical reactions in maintaining life, in developing new substances, and in the impact of these substances on the environment make it essential that students understand what chemical reactions are and how pervasive they are. Finally, students will study the physical states of matter. However more emphasis should be given to study the behaviour of gases.

In Grade 10, students will study organic chemistry. Here the concepts of functional groups, the importance of structure and nomenclature and the variety of organic compounds and reactions are stressed. They will also study the chemistry of oxides, acids, bases and salts. The importance of electrochemical technology to the production of chemicals is treated here under the topic electrochemistry. Finally the production of some important elements is treated. Here students will also study the important steps in production of some chemicals manufactured in Ethiopia. The impact of these chemicals in the environment and other environmental issues are discussed at the end.

At the second cycle of secondary education, students identify their area of study. So the science stream students are offered Chemistry courses that help them for their further studies such as applied sciences, earth science, agriculture, medicine and technology. The contents of Grades 11 and 12 are, in part, an extended and deeper look into topics covered in Grades 9 and 10. In addition, fundamental concepts in Chemistry, carboxylic acids, esters, fats and oils, solutions, acid-base equilibria, introduction to thermodynamics and polymers are delivered at this level.

Physics

Physics is a way of thinking about the physical aspects of nature. Physics is not better than art or poetry, which are also ways to think about nature; it is simply different. Physics looks for patterns and relationships in nature; develop the logic that relates different ideas; and research for the reasons why things happen as they do. It stresses qualitative reasoning, pictorial and graphical reasoning by analogy. Mathematics, of course, although indispensable to the practice of Physics, is an entirely different field of study.

The aim of the Physics curriculum is to motivate students and to facilitate their attainment of scientific literacy and profile as defined in policy document by the factors within the dimensions of scientific literacy. It also aims to stimulate students' interest and facilitate their attainment of underlying concepts of Physics ;and apply important principles in Physics to problems or situations; and help them sharpen their critical and analytical thinking skills; stimulate their curiosity and inquisitiveness about the physical world. The Physics curriculum aims to provide a balance of quantitative reasoning and conceptual understanding with special attention to concepts known to cause students difficulties, develop students' problem-solving skills in a systematic manner and support an active learning environment.

The study of Physics will enable students to understand important aspects about the world in which they live, and to make rational choices within a social, technological, and environmental context.

The activities included in the curriculum provide meaningful interactions between the students and their world in a manner encouraging sound scientific reasoning. The syllabus emphasises the 'process-dimension' of science. Without processes such as observing, measuring and hypothesising, there would be no scientific facts theories or laws. Most of the activities can be performed with materials found in the students' everyday environments. Some, of course, require equipment found in a typical Physics laboratory.

The Physics content of Grades 9 and 10 is a continuation of topics met in Grades 7 and 8 with deepening and broadening further and adding new topics. At this level, the emphasis is upon a deeper understanding of underlying concepts involving measurement, equations and simple calculations.

The Physics content of Grades 11 and 12 is designed for students who have chosen Physics as a subject vital for their future career. This is a preparatory stage, which links the secondary to the tertiary level. Preparatory level Physics provides a deeper, more quantitative treatment of the subject. Thermodynamics is placed before waves because it is a continuation of ideas from mechanics. The key idea in thermodynamics is energy. Moving from mechanics into thermodynamics allows the uninterrupted development of this important idea.

The Physics curriculum, with its emphasis of attaining the required profiles, attempts to make the study of the subject relevant to the needs of the society in general and Physics students in particular.

Basic Technical Drawing

Many young people have an early interest in engineering as a career. However, often they are not certain what an engineer does because they do not have the opportunity to get plants and laboratories of industry and see the actual activities that take place but they want to be one due to many reasons. The work of engineers covers a wide range of activities such as: designing, manufacturing, construction, maintenance, management, teaching and research etc.

Our education should help students to identify their interest and develop their potential for science and engineering at secondary school level. Therefore, basic Technical Drawing subject is designed for students to explore some of the well rounded introductory information, aspects, problems and opportunities in engineering.

What is Technical Drawing?

Technical Drawing is known as drafting. It is the practice of creating accurate representation of real world objects for technical, architectural, and engineering needs. This subject is offered to the second cycle of secondary education for Natural Science stream students. Technical Drawing in these grades covers basic drawing principles and conventions, practical drawing manual skill, and practical knowledge on how to describe the shape and size of an object.

The objectives of this subject are to help students:

- understand basic principles and conventions of Technical Drawing
- appreciate the contribution of Technical Drawing to society and in the industrial art process
- acquire basic knowledge and skills that support them for further education pertinent to Technical Drawing.

Social Sciences

Social sciences are a group of academic disciplines that study human behaviour. They study subjective, inter-subjective and objective or structural aspects of society. Social Sciences include history, geography, economics, anthropology, education law, political science, sociology and Civics Education.

History

History is a social science subject. It is the study of the totality of events and occurrences of the past and the conscious reconstruction of those events and occurrences. As a subject, history is a very old discipline and has always constituted an important component in the education of the young.

History lays the foundation for a common cultural frame of reference while providing a background for making one's own choices. The study of history enables individual students to develop a sense of identity and belonging. The pursuit of this subject brings the learner into contact with different cultures and traditions that provide both new stimuli and a basis for critical reflections.

History provides insight into the thoughts and actions of people who lived long ago. It also creates an awareness of how the events of our age were predetermined by choices made by people in previous ages. Placing the period in which we live today in a historical context enables people to gain a better understanding of themselves and their own times.

History is a subject that fosters an understanding of the frameworks around human lives. The knowledge of how men and women both create and take part in structures and processes raises awareness of the greater scheme of things, to which both individuals and fellow human beings belong.

History provides the necessary skills that help the students to practise the scientific method by asking questions, analysing causal links and applying a critical use of sources and other methods of gathering knowledge about the past.

History is a subject concerned with attitudes and values. It demonstrates the global diversity and wealth of cultural forms, social conditions and human ways of living throughout the ages. Insight into this diversity provides a sound basis for tolerance and respect. Historical studies of the causes of wars, conflicts and genocide provide opportunities for entering into the feelings of people confronted with difficult choices and ethical dilemmas. They also demonstrate how people throughout the ages have fought both for and against democracy, the rule of law, peace and non-violent resolution of conflicts. In recent times, the ethical challenge of the subject has particularly been associated with insight into the historical background for global environmental problems, social inequality, modern technology and the threat of nuclear war.

History is also a subject that provides an emotional and aesthetic experience. It arouses joy and interest and stimulates involvement. The aims of teaching history to the Ethiopian school students is to enable them acquire the above mentioned competencies so that they become competent, informed and efficient citizens who are ready for both world of work and higher education.

In Grades 9 and 10, History is provided to enable students to acquire basic historical knowledge (concepts, facts, skills) and acquaint them with major methodologies in studying history. History is provided to acquaint students with major landmarks and historical heritages in world history.

In Grades 11 and 12, it also introduces the scientific research methods that help learners arrive at truth and sound generalisations primarily as the foundation for further studies at the tertiary level of social sciences.

History teaching in Ethiopian secondary schools should continue in a greater depth and intensity with all necessary considerations to make the content of history more relevant and appropriate. The aim is to have a balanced way of presenting world, African and Ethiopian history, with more emphasis on areas that reflect the lives of the Ethiopian people.

Geography

Geography in Grades 9 and 10 will concentrate on imparting basic knowledge and develop skills for analysing spatial distribution and interaction among elements of the environment at local, regional, country and global level and their capacity to support human life. Moreover, basic concepts of earth science and population-related issues will be introduced to help students develop a scientific outlook on the natural and human phenomena that they encounter in their day-to-day activities. Besides, map reading skills will be provided to be used in understanding and interpreting geographical facts and concepts.

Geography for Grades 11 and 12 will focus on developing knowledge of the current socio-economic developments at global and micro-levels and on developing the skills for interpreting them scientifically. Therefore, the type of geography will be closely related to the major activities of mankind and to contemporary problems related to socio-economic developments particularly in Ethiopia and Africa and how to resolve them. Moreover, it capitalises their concept and skill of map reading by introducing learners about the use of

information communications technology (ICT) and introductory concepts of geographical information system (GIS).

Practice and experience shows that, by studying human nature, modern geography provides the knowledge, which leads to the discovery that not only does nature influence human beings but also there is much in nature which human beings in turn can govern and direct.

All in all, the subject is designed to contribute reasonably for providing an acceptable academic background to students who join higher education to study one of the fields of social sciences, humanities or business fields.

Civics and Ethical Education

Civics Education is defined as that part of the education of the young, which focuses on the healthy relationship between each citizen and the state in a political community. It brings into the successive growth and development of the young all the dimensions of this fundamental human relationships; all the ranges of rights and duties, freedom and responsibilities; provides the young with all the necessary capacities and skills, dispositions and attitudes; vision and meaning to life in general and to grasping of their specific manifestations as political, economic, social, and cultural phenomena.

Civics Education aims at envisioning and intellectual empowerment of the young. In other words, the provision of a sound formal Civics Education enriched by co-curricular activities is directed towards the development of disciplined thought, logical and critical thinking and participatory skills in the learner. Such abilities as asking good questions, clarifying issues, classifying information, distinguishing fact from opinion, identifying ideas and trends, making decisions, thinking deductively, thinking inductively, and employing problem-solving methods are expected from a sound Civics Education.

Civics and Ethical Education is an education for democratic self-government. Self-government means that citizens are actively involved in their own governance. They do not passively accept the dictums of, or acquiesce to the demands of, others. The ideals of democracy are most completely realised when citizens share in their own governance. Each citizen's participation must be based on informed, critical reflection; and in the understanding and acceptance of the rights and responsibilities that go with citizenship.

By drawing its contents from the various disciplines, the social sciences Civics Education endeavours to enrich the cultural and civic aspects of the learner for both better citizenship and academic preparation for the next cycle.

Civics Education at the preparatory level aims at responding to the needs of the learner and aspirations of the society, Civics Education deals with critical issues on the basis of relevant ideas, principles and theories with the prime intention of remedying individual and societal cultural constraints emphasising various basic principles, theories and models in different social science disciplines. Civics Education serves to introduce and familiarise students with basic concepts and lay firm foundations for further studies at the tertiary level.

Civics Education at the secondary level should aim at:

- developing personality traits that create informed, responsible, competent and committed citizens
- contributing to the development of intellectual powers, which include observation, understanding, critical and logical thinking, reasoning, judgement and decision making
- fostering positive attitudes and dispositions, which include self-education, right-duty consciousness, cooperative and tolerance
- equipping each learner with participatory skills in political participation, community participation, school participation, self-governance, negotiation and compromise.

Economics and General Business

More than ever before, nowadays all people need to understand the economic and business environment in which they live and work since they cannot exist without a supporting economy. Our domestic harmony, our political issues and our international relations all have their economic implications. As far as, in our life time we are exposed to a wide variety of economic questions, the conclusions we reach will be reflected directly (a) in the economic decisions we make as consumers, producers, savers and investors, and (b) in how we exercise our voting rights in determining policies that affect our economic welfare. Therefore, to the effective operation of the country's economic system and to the personal well-being of all members of the society, citizens must understand and know clearly the principles and facts of the economic and business world.

If the secondary schools are to meet the present and foreseeable future needs of today's youth, it would seem mandatory that they provide courses like economics and general business in relevant to the streams they enrol in. These courses should help students to understand how business, households and government operate in a market oriented economic system.

Economics

The Economics course is aimed at introducing students to the basics of economics by highlighting economic concepts, both from the micro and the macro perspective. The course deals with sectoral analysis of the Ethiopian economy. It shows past failures, achievements and future prospects. It provides students with examples of the problems hampering development and tries to show possible options for development. The course will prepare students to apply what they have learned in the classroom to the real economic life.

General Business

The General Business course is aimed at introducing students to the nature and scope of business, the forms of business organisation with special reference to the Ethiopian context; the functions of money, banking and other financial institutions; and the contributions they render in the economic and social development of the country.

Moreover, the course is intended to show the need for savings and the importance of investing intelligently; to acquaint students with the services essential to modern life in such fields as travel, transport and communication; and to broaden their understanding of how these services contribute to the development of the country's business system, to develop familiarity with effective methods of business record keeping; and to introduce the essence and importance of foreign trade and the documents used in importing and exporting.

To conclude, the Economics and General Business courses have to be seen in the light of new trends and development. They play a great role in our everyday life. Economic and general

business disciplines are prerequisites to various fields of study at tertiary level, because they provide students the readiness and background for in-depth understanding needed in further studies to be pursued in colleges and universities.

7.2.2 Timetable

Typically, students will attend school 5 days each week for 39 weeks each year. Of these weeks, 34 will be used for classroom activities. At present, each school day is 4 hours divided into 40 minute periods giving a total of 30 periods per week.

Table 5: First cycle General Secondary Education (Grades 9 and 10), 30 periods/week

Area	Subject	Grade	
		9	10
Languages	Mother Tongue	– (2)*	– (2)*
	Amharic	2	2
	English	4	4
Mathematics		5	5
Information Communications Technology		2	2
Natural Sciences	Physics	3	3
	Chemistry	3	3
	Biology	3	3
Social Sciences	Civics and Ethical Education	3	3
	Geography	2	2
	History	2	2
Physical Education		1	1
Total periods/week		30 (32)	30 (32)

Note:

* In the case of half days, the school day can be 32 periods for those regions that opt to offer Mother Tongue. Otherwise, it is 30 periods.

In the future, it is hoped to restore the school day to 35 periods. When this becomes the case, the 5 extra periods will be 2 for Mother Tongue and 1 for each of the three sciences.

The syllabus content of each individual subject should be of a suitable length to be delivered comfortably over 30 periods/week. If, in the future, the school week rises to 35 periods, the extra time will allow teachers to carry out more practical work with students, time to develop higher learning skills and teach local /regional needs. This gives regions opportunity use the syllabus flexibly. The syllabus content should not, under any circumstances, be based on 35 periods/week.

Table 6: Second cycle Secondary Education (Grades 11 and 12), 35 periods/week

Stream	Course	Grade	
		11	12
<i>NATURAL SCIENCES</i>	Specialised Courses		
	1. Biology	4	4
	2. Chemistry	4	4
	3. Physics	4	4
	4. Technical Drawing	2	2
	Common Courses		
	5 Civics and Ethical Education	3	3
	6. English	6	6
	7. Information Communications Technology	3	3
	8. Mathematics	5	5
9. Physical Education	1	1	
Elective Course			
10. Mother Tongue/Nationality Language or Amharic	3	3	
	Total periods per week	35	35
<i>SOCIAL SCIENCES</i>	Specialised Courses		
	1 Geography	4	4
	2. History	4	4
	3. Economics	4	4
	4. General Business	2	2
	Common Course		
	5 Civics and Ethical Education	3	3
	6. English	6	6
	7. Information Communications Technology	3	3
	8. Mathematics	5	5
9. Physical Education	1	1	
Elective Course			
10. Mother Tongue/Nationality Language or Amharic	3	3	
	Total periods per week	35	35

8. Assessment and Promotion

Every teacher should carry out regular checks on the progress of all students in each subject. This is done through continuous and formal assessment. It is intended to be a spontaneous and natural part of the teaching and learning process, not merely an activity that takes place at the end of the term or year. It should ensure that students at all levels are genuinely able to achieve the competencies expected of them.

In addition to the formal, conventional tests, a key requirement of the implementation of the revised curriculum will be the planning of assessment tasks as part of the school program that will show teachers whether or not students are achieving the expected competencies. These tasks are intended to be completed throughout the year. Such assessment is known as continuous assessment. Continuous assessment must:

- be interesting for students to complete
- help teachers assess the new learning outcomes
- help teachers analyse the kinds of mistakes that students make in order to be able to help them improve.

By assessing students in this way:

- their ability to achieve the competencies can be monitored day by day
- they can be informed of their achievements and encouraged to perform better
- the results obtained can be used for promotion
- information on their achievements can be given to parents/guardians, administrators and others
- new plans for effective teaching and learning can be made
- records can be kept of students' progress throughout the term and year
- those with learning difficulties can be identified so that remedial work can be provided
- those who are talented and gifted can be provided with enrichment work

Assessment can be done using oral, written or practical assessment.

Assessment through oral work

Teachers need to observe students and engage them in questioning and discussion. Useful evidence of understanding can be obtained when students are encouraged to talk about how they undertake their tasks.

Steps to follow when assessing students through oral work include:

- select the competencies to assess in a given learning area
- set activities to assess the students
- give the activities to the students
- observe and record each student's achievement of the competencies expected at the given level
- observe and assess life skills and values as students participate.

Oral work is important since it helps the students to develop their listening and speaking skills, which are important in the development of reading, writing and mathematical concepts, life skills and values.

Assessment through written work

Written work is the most common source of evidence that a student has achieved a competency. As well as correcting written work and asking students to amend it, teachers

could ask students to explain in writing what they did. Students should also have the opportunity to redraft and present their best effort.

Steps to follow when assessing students through written work include:

- select the competencies to assess in a given learning area
- set activities to assess the students
- give the activities to the students
- mark the work done by individual students and record each student's achievement
- ensure that students do corrections and that these are marked
- students' work is checked and marked regularly and helpful comments are made.

Assessment through practical work

Practical work provides teachers with excellent opportunities to observe and assess their students' performances and raise issues for discussion and then analyse their answer. By observing how students start a task, apply their knowledge to a task, choose the correct resources for the task and report clearly on their results, teachers have evidence of students' understanding and learning.

Steps to follow when assessing students through practical work include:

- select the competencies to assess in a given learning area
- set activities to assess the students
- give the activities to the students
- display students' work
- observe and assess life skills and values as students work.

In assessing life skills and values, students should be able to:

- share and be tolerant
- respect themselves and others
- work with others comfortably
- express themselves clearly
- be responsible for their own actions.

Students in the first cycle of primary education should be assessed using continuous assessment only with no formal conventional examinations given. Their promotion will depend only on continuous assessment. The primary purpose of assessment at this stage must be diagnostic and remedial. If a student is failing to achieve a particular competency the teacher should provide remedial work so that the student can catch up. If another student is achieving at a high level all the time, the teacher should find more challenging work for that student. Although this is an ideal, it may not be easy to achieve for very large class sizes, but it is a standard that must be attempted. Assessment without remedial support is of little value at this stage of learning. If sufficient support is available, both in terms of supervision and teaching materials, teachers will be able to provide this type of diagnostic and remedial style assessment.

In the second cycle of primary education, conventional examinations will be given at the end of each term and promotion will depend on both continuous assessment and the conventional examinations.

A regionally administered national examination is given at the end of Grade 8. Those students who pass the examination will be placed in the first cycle of secondary education – Grades 9 and 10.

After completion of Grades 9 and 10, students will sit the General Secondary Education Examination in which those students eligible for higher education will be decided.

Selection for higher education is determined by successful completion of Grades 11 and 12 and a pass mark in the subjects in their respective stream.

It is essential that training is given to teachers in the primary cycles in continuous assessment. They should be trained in both the assessment of their students and in methods of recording this.

Appendix 1

Lesson Structure

Lessons should be divided into parts and involve a variety of activities. Typically a lesson will have 4 parts.

Part 1: Introduction

The teacher will outline on the board the main learning outcomes expected in the lesson – about 2 to 3 minutes. This may take the form ‘all students will be expected to...’, ‘some will...’

The outcomes should use language the students will understand and should be phrased in such a way as to not pre-empt the results if students are engaged in discovery learning.

For example: when students are investigating Pythagoras’ Theorem, they should not be told the relationship between the 3 sides of a right-angled triangle in advance. The learning objective might be therefore to ‘discover the relationship between the lengths of the 3 sides of a right-angled triangle. If some new words are being used, these could be written large on pieces of card and displayed on the wall.

Part 2: Starter Activity

This will be short – about 5–6 minutes. It will actively involve the students. It may partly refer back to the previous lesson’s objectives but will also set the scene for the current lesson. Examples of starter activities include a short quiz, matching activities, sequencing activities, practical demonstration with questioning, questioning of the class with use of small whiteboards/slates or ‘traffic light cards/ Thumbs up method’ to involve all students.

Part 3: Main Activity

This will take up about 25 minutes. This is the main activity for the lesson. It may be teacher explanation with questioning, group work or individual work.

Part 4: Plenary

The teacher gives the students a short activity (about 7 minutes), which checks their understanding against the desired learning outcomes.

For example: this may be whole class questioning with the use of small whiteboards or traffic light cards, a matching or a sequencing activity.

Appendix 2

Some examples of active teaching and learning strategies

This list is not comprehensive. It is not compulsory. These are examples of strategies, which have been shown, in other countries, to work well in motivating students.

There will be some teaching strategies, which are specific to a particular subject but many active approaches can be used across the curriculum. Teaching strategies, with examples, will be examined in detail for each subject in the curriculum. The use of different strategies will have to recognise the class sizes in Ethiopian schools. There are major training implications in order for new teaching methods to be implemented effectively. A wider range of activities needs to be written into curriculum materials.

Good teaching results in students being interested and actively engaged. There are a number of features to good teaching. Examples include:

- The work is pitched at the right level to ensure a good level of challenge for all students.
- The lesson proceeds at a good pace
- Teachers make use of a good variety of activities. This helps to engage and sustain students' interest. Active teaching methods involve the students in doing things, and finding out for themselves. There should not be prolonged periods of teacher talk – 10 to 15 minutes is the maximum at one time.
- The teacher has good relationships with the children and there is good discipline and behaviour.
- All students are interested and working well. They make good progress in learning new skills and/or in their knowledge and understanding of a concept.

Analogies: concepts are explained by making a comparison with another system e.g. the working of the human body can be compared with the division of labour in a factory.

Arguments for and against an issue: Students consider an issue e.g. the benefits and drawbacks of plastics, and then decide whether they are 'for' or 'against'. They can summarise this in written form and could also give verbal feedback.

Assessment for learning: Students are told/shown what good work looks like and have to assess their own work against the criteria. They may also assess constructively the work of other students and give them feedback. This helps students internalise assessment criteria by making them meaningful. Teachers should also use continuous assessment to help them identify what students can do and know.

Cartoon strips: Students draw a cartoon strip to summarise information, process or event.

Comprehension: Students are given information about a topic. This should be broken into short 'chunks' and should be pitched well in terms of language level and conceptual demand. Good use should be made of pictures and diagrams. Students are asked questions, which test their understanding.

Concept mapping: The teacher provides students with a list of key concepts for a topic e.g. weathering of rock in geography. The students stick these in their books and draw and label arrows to show how the concepts are linked.

Data Analysis: Students are given data and have to extract information from this. For example: death rates in the population and how this is affected by hygienic conditions.

Debate: These would have to be well managed with the large class sizes. All students could be involved in research about an issue e.g. the drawbacks and benefits of being a vegetarian. A class of 70 students might be divided into 10 groups of 7, each with a student who is a team leader. The team leader would manage the discussion in the group. After a suitable time for the students to research information and discuss the issues, 2 teams would be picked by the teacher to debate in front of the class. The class would use criteria, which they have developed and shared beforehand – to assess each teams’ performance. Over the year, the teacher would ensure all students had been involved in a debate at least once.

Demonstrations: A good demonstration should be clearly seen by all and should make the students think. For example: in science the teacher could show students that flour in a bag does not explode when a match is placed near, but flour mixed with air does explode. The students have to make suggestions as to why this happened with support from the teacher.

Descriptive writing: Students have to use their skills of accurate observation to produce an accurate description of an event, object or process. For example: students might write a descriptive piece about their walk to school each day.

Designing: Students are asked to design an object or process for themselves and justify their design. For example: they might design a type of salad to appeal to a certain group of people, such as young people who are health conscious.

Discussion: With large class sizes this would have to be carefully managed. This has been discussed above under debate. Discussion in groups does not have to always be followed by debate. Each group could summarise their views in written form, or as a set of bullet points, or even pictorially.

Drama: Group work could lead to a small group being given the task of ‘acting out’ an issue in front of the class e.g. hygienic practices to be adopted before preparing and eating food.

Evaluation: Students are given information about an event or process and have to evaluate it. For example: students in teams may have been asked to design the best wind-powered buggy. The teams would come up with evaluation criteria, which would be discussed and agreed in the class. The agreed criteria would then be used to decide the winning team.

Games: There are many good educational board games that could be played in groups of 6 or 7.

Group work: This has been considered under debate and discussion.

ICT: Computers can be used to research information on the Internet, to prepare presentations, to handle data and to sense changes such as temperature, as well as to control events.

Imaginative writing: Students can write an imaginative essay or piece not just in language lessons. For example: in History they might write a short play.

Independent work: Students can work on their own in a variety of ways, for example: to research information or make a model. Students need to engage in a balance of group work and independent work.

Matching activities: Students are given 2 sets of cards about a topic. The sets are different colours. The cards are mixed up but, in each set, one card corresponds to one in the other set. The students have to match up the pairs. For example: one pair might have the Amharic word in large letters and the other one the English word. Or one set of cards might be pictures and the other words.

Model making: Making models can help students grasp an idea better. In Science, students could make a model to show the general structure of a cell.

Modelling: Students themselves model a process. In science they might act out a solid changing into a liquid for example.

Musical activities: Even outside music, these have their application. Songs, jingles and rhymes help many people learn. In Geography, students might make up a song, or rap about different types of pollution.

Pictures: students can be asked to interpret pictures or photos to explain what is happening. For example: in Geography, a sequence of photos or pictures over time will show how a village has changed and developed. The students can be asked to explain why, and the effect of this.

Planning activities: Students can be asked to draw up plans in many areas of the curriculum. For example: they might plan a concert party for the community.

Practical work: Practical work is important in many subjects, but large class sizes mean this has to be managed very carefully. Possibly one way would be for the class of say 70 to be split into 10 groups of 7. In each group, one pair would carry out the practical, watched by the others. The others might evaluate the skills of the pair, using previously agreed criteria. Over time all students would do some practical work.

Presentations by children: Group work, as described above, could lead to one pair from each group making a presentation.

Poster work: Groups of students might design a poster to summarise and illustrate a certain concept, event or process. For example: they might summarise what makes a healthy diet, using pictures and words.

Problem solving: Students might, for example, design a straw built tower to be as strong as possible, given the use of a certain number of straws.

Questioning: Closed questioning such as ‘What is the name of.....?’ checks students’ knowledge. More open questions such as ‘What would happen if.....?’ ‘Explore students’ understanding in more depth because they have to give an answer at greater length and explain this.

Reading: Students can be asked to read out loud short passages while others listen. Students can read short sections of text and identify areas e.g. all adjectives in a short passage in a language lesson or all elements in a science class.

Research: Students have to find out information for themselves. This could be an extended project that takes several weeks of teaching time. For shorter projects different groups of students could find out about different aspects of a topic and then present information to the others. For example: in science different groups of students might research the functions of different parts of the cell from their textbooks and library materials.

Role play: A group of students would act out a situation or event in front of the class. For example: they might act out an historical event, playing the roles of the different participants and making up possible dialogue. In a large class, all students may have researched information and prepared their own script, which the teacher could assess. Sample groups would act out their role play.

Sequencing activities: Students are given a series of cards showing pictures and/or words relating to an event or process. The cards are mixed up. Students have to put them in the correct order. In Geography, for example, the cards might show the steps in the water cycle.

Surveys: Students gather information and present this information in a suitable way. For example: they might collect information about students' favourite pets and plot graphs to show this.

Talk partners: At interval in the lesson, the teacher can tell the students to turn to their 'talk partners' to quietly discuss a problem or issue – for 3 to 4 minutes. This is a good way of involving all students.

Traffic light cards: Each student has a set of 3 small cards – red, amber and green. The teacher makes statements to the class. In response, they all hold up their cards – green if they agree red if they disagree and amber if they are not sure. This is a very good way for the teacher to check students' understanding and adapt their teaching approach if need be. It can be used as a starter or plenary activity.

Videos, CDs, DVDs: To make these interactive, the teacher should stop them at suitable intervals and ask students questions concerning what they have seen.

Visits: Students are taken to places of special interest such as parks and museums. Students can be given a questionnaire to complete. The students themselves could contribute to the construction of the questionnaire before the visit.

Visitors: Visitors can enrich the curriculum in all areas. The students can generate questions to ask the visitor beforehand. For example: they might question an older member of the community about what life was like in past times.