



Republic of Zambia

**MINISTRY OF EDUCATION, SCIENCE, VOCATIONAL TRAINING AND EARLY  
EDUCATION**  
**BRAILLE SYLLABUS**  
**Special Education**  
**GRADES 10 - 12**



**PREPARED AND PUBLISHED BY THE CURRICULUM DEVELOPMENT CENTRE**  
**P.O. BOX 50092, LUSAKA – ZAMBIA**  
**2013**

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# VISION

Quality, life long education for all which is accessible, inclusive and relevant to individual, national and global needs and value systems.

## **PREFACE (draft)**

The syllabus was produced as a result of the Curriculum review process carried out by the Ministry of Education, Science, Vocational Training and Early Education under the auspices of the Curriculum Development Centre (CDC). The curriculum reform process started way back in 1999 when the Ministry of Education commissioned five (5) curriculum studies which were conducted by the University of Zambia. These studies were followed by a review of the lower and middle basic and primary teacher education curriculum. In 2005 the upper basic education National survey was conducted and information from learners, parents, teachers, school managers, educational administrators, tertiary institutions traditional leaders civic leaders and various stakeholders in education was collected to help design a relevant curriculum. The recommendations provided by various stakeholders during the Upper Basic Education National survey of 2005 and National symposium on curriculum held in June 2009 guided the review process.

The review was necessitated by the need to provide an education system that would not only incorporate latest social, economic, technological and political developments but also equip learners with vital knowledge, skills and values that are necessary to contribute to the attainment of Vision 2030.

The syllabus has been reviewed in line with the Outcome Based Education principles which seek to link education to real life experiences that give learners skills to access, criticize analyze and practically apply knowledge that help them gain life skills. Its competences and general outcomes are the expected outcomes to be attained by the learners through the acquisition of knowledge, skills, techniques and values which are very important for the total development of the individual and the nation as a whole.

Effective implementation of Outcome Based Education requires that the following principles be observed: clarity of focus, Reflective designing, setting high expectations for all learners and appropriate opportunities.

It is my sincere hope that this Outcome Based syllabus will greatly improve the quality of education provided at grades 10 - 12. as defined and recommended in various policy documents including Educating Our Future`1996 and the `Zambia Education Curriculum Framework `2013.

Chishimba Nkossa

Permanent Secretary

**MINISTRY OF EDUCATION, SCIENCE, VOCATIONAL TRAINING AND EARLY EDUCATION.**

## **ACKNOWLEDGEMENTS**

My sincere thanks goes to the Directorate of Standards and Curriculum for initiating the reforms that led to the review of all syllabuses from Early childhood, Care, Development and Education to Secondary School. Special thanks also go to the Special Education section for the commitment that was exhibited during the development of this syllabus. I would like to give my special thanks to the visual impairment unit at Curriculum Development Centre for defending and demonstrating full commitment towards the production of this syllabus.

I am also very grateful to the University of Zambia and Zambia Institute of Special Education, their input helped to harmonise the curriculum for schools and that for higher institutions. Finally, I want to thank the teachers for learners with Visual Impairments for bringing out their experiences that helped in the consolidation of this syllabus.

C. N. Sakala (Mrs.)

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**Ministry of Education, Science, Vocational Training and Early Education**

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## **INTRODUCTION**

Braille is a tactile writing system used by the blind learners. It can be used to represent letters of the alphabet, numbers, punctuation marks, including different symbols used in various subjects. Braille is read using the sense of touch.

This syllabus has used the English Braille, which has two levels of encoding at primary level:

- Grade 1 braille: Letter-by-letter transcription, it is used in basic literacy
- Grade 2 braille: Abandons the letter-by-letter transcription in several places, adds several abbreviations and contractions

Besides Braille, the syllabus also deals with interpretation of maps, diagrams, charts and other symbols used in various subjects. The syllabus is in line with the Braille primer of 2005. The syllabus is a guide; the teacher is free to use his/her own discretion depending mainly on the related topics in the content subjects as well as the learner's learning ability.

## **TIME ALLOCATION**

Three (3) periods of 40 minutes each should be allocated per week.

## **ASSESSMENT**

There are no final examinations for this subject; however, class exercises to enhance braille reading and writing should be given.

## **RATIONALE**

Learners with visual impairments highly depend on the tactile sense to learn. Though Information Computer Technology is becoming quite useful, it cannot replace Braille. Learners with visual impairments should be taught Braille to enable them learn other subjects. In addition most teachers in inclusive settings are unable to help learners with visual impairments because they are not experts in braille, therefore, there is need for braille writing and reading to be timetabled.

**GRADE TEN**

<b>KEY COMPETENCES</b>	<b>GENERAL OUTCOME:</b>
<p>To demonstrate ability of braille reading and writing</p> <p>To show ability of applying braille skills in various subjects</p> <p>To show ability of interpreting maps and diagrams in various subjects</p> <p>To show ability of using information computer technology in the learning process</p>	<p>Application of braille to content subjects</p>

TOPIC	SUB – TOPIC	Specific Outcome	CONTENT		
			Knowledge	Skills	Value
10.1. Braille Equipment	10.1.1. Assembling of Braille Equipment	10.1.1.1 Identify different types of Braille equipment.	Braille board, pocket frame, writing frame, Perkins Braille.	Recognition of braille equipment	Appreciation of braille equipment
10.2. Information Computer Technology	10.2.1 Assistive Devices	10.2.1.1 Describe the use of modern Assistive Devices	Dolphin pens, Thunder, Computer, Perkins Braille	Communication with the help of the devices	Creativity in daily living
10.3. Braille Mathematics	10.3.1 Mathematical Aids	10.3.1.1 Discuss Mathematical Aids	Embossed measuring tapes & rulers, talking calculators, clock faces, protractors, abacus, embossed cotter pins, and tailor frames	Problem solving using the Mathematical aids	Feel of self-esteem in daily life
	10.3.2. Recurring decimal	10.3.2.1 Identify symbols for recurring decimal	Recurring decimal dot: 5	Identifying the recurring decimal	Analysis in daily activities
	10. 3.3 Small and capital letter signs	10.3.3.1 Identify symbols for small and capital letter signs	Small letter sign (2a+3b) dots: 5,6,4 Capital letter sign dots: 4,5,6 ( R+2c)	Problem solving involving algebraic equations	Critical thinking in daily life
10.4 Graphics Interpretation	10.4.1 Diagrams in subjects	10.4.1.1 Identify diagrams in various subjects	Venn diagrams, plant and animal cells, etc	Tracking information on diagrams	Appreciation of information

TOPIC	SUB – TOPIC	Specific Outcome	CONTENT		
			Knowledge	Skills	Values
10.5 Braille Mathematics	10.5.1 Sets	10.5.1.1 Identify Braille symbols used in sets	$\equiv$ (equivalent to), $\cap$ Intersection set, $\cup$ union, $\in$ <i>is an</i> Element of , and $\emptyset$ , { } Empty set dots	Identifying set symbols	Application to independence living
	10.5.2 Algebra	10.5.2.1 Demonstrate Braille symbols used in algebraic expressions	/ (oblique stroke, (fraction line sign)	Identifying algebraic symbols	Problem solving In daily life
	10.5.3. Inequalities	10.5.3.1 Identify Braille symbols used in inequalities	$<$ (less than), $\leq$ (less than or equal to) , $>$ (greater than), $\geq$ (greater than or equal to)	Identifying inequality symbols	Problem solving In daily life
	10.5.4 Approximation and Estimation	10.5.4.1 Discuss braille symbols used in Approximation and Estimation	$\approx$ (Approximately, equally to)	Identifying Approximation and Estimation symbols	Problem solving In daily life
	10.5.5 Variation	10.5.5.1 Express Braille symbols used in Variation	$\propto$ (varies as, proportional to)	Identifying inequality symbols	Problem solving In daily life

TOPIC	SUB – TOPIC	Specific Outcome	CONTENT		
			Knowledge	Skills	Value
10.6. Braille Physics	10.6.1 Units for measurement	10.6.1.1 Identify symbols for units: distance, time, volume and density	Distance [millimeters (mm), metre (m) kilometre (km)] Time [seconds (s), hours (hrs)], Volume [cubic centimeters (cm <sup>3</sup> ), cubic metres (m <sup>3</sup> ) and Density (g/cm <sup>3</sup> ) (kg/m <sup>3</sup> ) ]	Identifying braille symbol in Physics	Independence in daily life
10.7 Braille Chemistry	10.7.1 Chemical Formulas	10.7.1.1 Identify Braille symbols for Elements	Dot 6 before single letter symbols e.g.: O (dot 6 O), H (dot 6H)  Na ( dots 5Na) Fe (dot 5Fe) Cl (dot 5Cl)	Identifying symbols for elements	Independence in daily life
	10.7.2 Atomic Structures	10.7.3 Identify Braille Symbols for Atomic Structure	E.g. Oxygen atom $^{16}_8\text{O}$	Ability to identify symbols for atomic structures	Critical thinking in daily life

**GRADE ELEVEN**

<b>KEY COMPETENCES</b>	<b>GENERAL OUTCOME</b>
<p>To demonstrate ability of braille reading and writing</p> <p>To show ability of applying braille skills in various subjects</p> <p>To show ability of interpreting maps and diagrams in various subjects</p> <p>To show ability of using information computer technology in the learning process</p>	<p>Application of braille to content subjects</p>

TOPIC	SUB – TOPIC	Specific Outcome	CONTENT		
			Knowledge	Skills	Value
11.1 Braille Chemistry	11.1.1 Compounds and Molecules	11.1.1.1 Explain symbols for compounds and molecules	e.g. $O_2$ , $H_2O$	Identifying symbols for compounds and molecules	Application to independence living
	11.1.2 pH scale	11.1.2.1 Demonstrate writing the pH scale	pH 4 pH 7 pH 12	Recognising symbols for pH scale	Problem solving In daily life
	11.1.3 Electron Configuration Structures	11.1.3.1 Identify symbols for electron configuration	Electron configuration structures, e.g., (Na, 2,8,1)	Identifying symbols for electron configuration	Problem solving In daily life
	11.1.4 Compounds	11.1.4.1 Describe symbols for Compounds	$CuSO_4$ , $NaOH$ $Ca(OH)_2$ (Dot 6 before the letters if all letters are capital letters e.g. NO)	Communication in Science	Problem solving In daily life
	11.1.5 Chemical Equations	11.1.5.1 Discuss braille symbols used in chemical equations	Chemical formulas, e.g. $H_2(g) + I_2(s) = 2HI(g)$	Identifying symbols in chemical equations	Problem solving In daily life



TOPIC	SUB – TOPIC	Specific Outcome	CONTENT		
			Knowledge	Skills	Value
11.2 Graphics Interpretation	11.2.1 Graphs and Charts	11.2.1.1 Interpret graphs	Line graphs, Bar graphs, etc	Tracking and locating information on graphs and charts	Problem solving related to orientation
11.3  Braille Mathematics	11.3.1 Matrices	11.5.1.1 Identify Braille symbols used in Matrices	Matrix bracket ( ) dots: 1,2,3,4,5,6.	Identifying the Matrix symbol	Problem solving in daily life
	11.3.2 Quadratic Equations	11.5.2.1 Explain Braille symbols used in Quadratic Equations	$\pm$ Plus or minus (dots, 5,6,2,3,5,3,6)  $\mp$ Minus or plus (dots 5,6,3,6,2,3,5)	Identifying braille symbols for Quadratic Equations	Problem solving in daily life
11.4. Braille Chemistry	11.4.1 Chemical ions	11.6.1.1 Explain Braille symbols for Electron structures	Ions: sodium - Na <sup>+</sup> (2,8) Aluminium - Al <sup>3+</sup> (2,8)	Identifying the symbol for chemical ion	Problem solving in daily life
	11.4.2 Ionic Equations	11.6.2.1 Discuss Braille symbols used in ionic equations	e.g $2\text{Na}^+ + 2\text{Cl}^- \rightarrow 2\text{Na}^+\text{Cl}^-$	Identifying symbols for ionic equations	Problem solving in daily life
11.5 Braille Physics	11.5.1 Units for Work, Force and Energy	11.7.1.1 Identify symbols for units Work, Force and Energy	Hertz (Hz) Newton (N) Joules (J)	Identifying symbols for units for Work, Force and Energy	Independence in daily life
	11.5.2 Units for Electricity and Temperature	11.7.2.1 Identify symbols for units for electricity and temperature	Volt (V) Watts (W) Coulomb (C) Ohm $\Omega$ Degree Celsius ( $^{\circ}\text{C}$ ) Amperes (A)	Identifying symbols for units for electricity and temperature	Independence in daily life

**GRADE TWELVE**

<b>KEY COMPETENCES</b>	<b>GENERAL OUTCOME</b>
<p>To demonstrate ability of braille reading and writing</p> <p>To show ability of applying braille skills in various subjects</p> <p>To show ability of interpreting maps and diagrams in various subjects</p> <p>To show ability of using information computer technology in the learning process</p>	<p>Application of braille to subjects</p>

TOPIC	SUB - TOPIC	Specific Outcome	CONTENT		
			Knowledge	Skills	Value
12.1 Braille Mathematics	12.1.1 Trigonometry	12.1.1.1 Explain Braille symbols used in Trigonometry	<p>Sin dots: 1,2,4,6 2,3,4.</p> <p><math>\text{Sin}^{-1}</math> dots: 1,2,4,6 4,2,3,4</p> <p>Cos dots: 1,2,4,6,1,4.</p> <p><math>\text{Cos}^{-1}</math> dots 1,2,4,6,4,1,4</p> <p>Tan dots: 1,2,4,6,2,3,4,5</p> <p><math>\text{Tan}^{-1}</math> dot: 1,2,4,6,4,2,3,4,5</p>	Identifying the Trigonometric symbols	Problem solving in daily life
	12.1.2 Earth Geometry	12.1.2.1 Explain Braille symbols used in Earth Geometry	<p>° (degrees) dots: 3,5,</p> <p>'(Minutes) dots: 4,6</p>	Identifying Earth Geometry symbols	Problem solving in daily life
	12.1.3 Vectors and Indices	12.1.3.1 Discuss Braille symbols used in vectors	<p>Superscript or subscript arrow for vector) eg <math>\vec{AB}</math></p> <p>Top index sign (power indices)</p>	Identifying Vectors and Indices symbols	Problem solving in daily life

TOPIC	SUB - TOPIC	Specific Outcome	CONTENT		
			Knowledge	Skills	Values
12.2 Organic Chemistry	12.2.1 Hydrocarbons	12.2.1.1 Explain Braille symbols used in Benzene rings	Benzene rings dots:1,2,3,4,5,6	Identifying symbols for Benzene rings	Awareness of symbols for Benzene rings
		12.2.1.2 Explain Braille symbols used in Hydrocarbons	Hydrocarbon dots: 2,4,6,3,3,3,AND dots	Identifying symbols for hydrocarbons	Awareness of symbols for hydrocarbons
12.3 Graphics Interpretation	12.3.1 Diagrams and Charts	12.3.1.1 Identify & interpret different types of embossed diagrams, charts and maps in different subjects	e.g. Biology: Circulatory system Geography: Globe History: Bantu migration Agriculture: Farming implements, etc	Tracking of information on diagrams and charts	Creativity to daily living

## Braille Scope and Sequence Chart: Grades 10 – 12

TOPIC	GRADE 10	GRADE 11	GRADE 12
Braille Equipment	Assembling of Braille Equipment		
Information Computer Technology	<b>Modern Technology</b> Speech devices: Dolphin pens, Thunder, Computer, Perkins Braille		
Use of Mathematical Aids	Mathematical Aids Embossed measuring tapes, rulers, Talking calculators, protractors, clockface, embossed mathematical instruments		
Braille Mathematics	Fractions  Sets  Algebra  Inequalities  Approximation and Estimation  Variation	Indices  Quadratic Equations  Matrices Plus or minus, minus or plus	Trigonometry  Vectors  Earth Geometry  Trigonometry  Earth Geometry
Braille Physics	SI Units for distance, time, volume and density	SI units for Work, Force and Energy  SI units for Electricity and Temperature	

Braille Chemistry		Chemical Formulas Atomic Structures Compounds and molecules Electron configuration structures Chemical ions Ionic Equations Balancing of chemical equations	Benzene rings  Hydrocarbons
Diagrams and maps	Maps, Diagrams, Models Charts, Figures, Tables		