1. Teaching/learning aim

The aim of teaching Mathematics, which can be placed among the general aims of school education, is to facilitate the pupils' personal development and provide them with the necessary skills for their smooth social integration.

Mathematics can help pupils develop structured and critical thinking abilities and improve their reasoning abilities of analysis, abstraction and generalisation that will enable them to express their thoughts in a neat, clear, simple and accurate way.

Mathematics also sharpens pupils' abilities of observation, self-concentration and persistence, stimulate their initiative, creative imagination and freethinking and develop their sense of order, harmony and beauty.

Mathematics is a necessary tool in everyday life, especially at the workplace, and has a significant contribution to the development of other scientific fields, especially Technology, Economics and Social Studies.

2. Content Guiding Principles, Goals, Indicative Fundamental Cross-thematic Concepts

I. Primary school

Grade	Content Guiding Principles	General Goals (Knowledge, skills, attitudes and values)	Indicative Fundamental Cross-thematic Concepts
1st 2nd 3rd 4th 5th	**Problem solving**	**Pupils should:** explore mathematical situations; make enquiries; pose problems and formulate questions from everyday life and mathematical	**Change Interaction System Communication Individual- Group/ Ele-**

6th		situations, rephrase problems, recognize and describe similar problems and mathematical situations, investigate open-ended problems; use calculators, computers and other re-sources; apply their mathematical skills in every day life situations.	**ment-Set Similarity-Difference**
1st	**Numbers and operations**	count orally, read, order and write natural numbers up to 100; add or subtract natural numbers no greater than 20; become familiar with situations that entail multiplication and division, such as equal groupings of objects and sharing equally.	**Change Communication Individual-Group/ Ele-ment-Set Similarity-Difference**
	Measurement	become familiar with the concepts of length, time, money and mass; describe, extend and make generalizations about geometric and numeric patterns.	**Change System Space–Time Similarity-Difference**
	Geometry	develop spatial sense, draw, reproduce, recognize, name and classify geometrical figures; identify solids: cubes, rectangular prisms, cylinders, spheres; recognize reflective symmetry in pictures and figures.	**System Communication Space–Time Similarity-Difference**

2nd	Numbers and operations	count orally, read, write and order natural numbers up to 1,000; add, subtract and multiply numbers no greater than 100; use the commutative and associative property in addition and multiplication; understand division as a process of equal sharing.	**Change** **System** **Space–Time** **Individual-** **Group/ Ele-** **ment-Set** **Similarity-** **Difference**
	Measurement	measure length and surface using standard and non-standard units; measure time, money and mass; describe, extend and make generalizations about geometric and numeric patterns.	**Change** **System** **Space–Time** **Individual-** **Group/ Ele-** **ment-Set** **Similarity-** **Difference**
	Geometry	draw and reproduce geometrical figures and recognize their geometrical features; define points and draw segments and straight lines; recognize by experience parallel and vertical lines; identify solids (cubes, rectangular prisms, cylinders, spheres); recognize reflective symmetry of a geometrical figure and use rules of symmetry to complete a figure design.	**Change** **Interaction** **System** **Culture** **Individual-** **Group/ Ele-** **ment-Set** **Similarity-** **Difference**

3rd	Numbers and operations	count orally, read, write and order, natural numbers up to 10,000; add, subtract and multiply natural numbers no greater than 1,000; develop number sense for fractions and decimals; become familiar with the algorithm of multiplication and division of natural numbers.	**Change** **Interaction** **System** **Individual-** **Group/ Ele-** **ment-Set** **Similarity-** **Difference**
	Measurement	identify and use the measurement units of length, time and mass; recognize a pattern and understand that iteration processes are infinite.	**Change** **Interaction** **System** **Space–Time**
	Geometry	describe, reproduce and draw figures and solids by means of vertical lines drawn with the help of instruments; become familiar with vertices, edges, right angles and sides; draw symmetrical figures using reflective symmetry.	**System** **Space–Time** **Symmetry** **Individual-** **Group/ Ele-** **ment-Set** **Similarity-** **Difference**
4th	Numbers and operations	count orally, read, write and order natural numbers up to 1,000,000; add, subtract and multiply natural numbers no greater than 1,000; perform operations with decimal numbers and decimal fractions.	**Change** **System** **Individual-** **Group** **Similarity-** **Difference**
3rd			

	Measurement	measure length, area, time, mass and capacity; convert units of measurement and practise additions and subtractions using compound numbers; become familiar with simple numerical and geometrical patterns.	**Change** **System** **Space–Time** **Culture** **Individual-Group/ Element-Set** **Similarity-Difference**
	Geometry	draw parallel and vertical lines as well as geometrical shapes with the use of appropriate instruments; calculate the perimeter of simple figures understand intuitively the concept of surface; construct reflective figures on squared paper.	**System** **Space–Time** **Individual-Group/ Element-Set** **Symmetry** **Similarity-Difference**
	Gathering and processing data	practice collecting, classifying, representing and interpreting data; develop an appreciation for the use of probability in the real world.	**System** **Organization**
5th	**Numbers and operations**	count orally, read write and order natural numbers up to 100,000,000 as well as fractions and decimals; add, subtract, multiply and divide natural numbers, fractions and decimals; add and subtract compound numbers	**System** **Individual-Group/ Element-Set** **Similarity-Difference**

		find the multiples of 2, 3, …, 10; know which numbers are divided by 2, 5 and 10.	
	Measurement	consolidate knowledge of standard measurement units of length, area, mass, time and capacity and be able to apply these measurements in every day life; recognize, describe and extend simple arithmetic and geometrical patterns.	**Change System Space–Time Culture Similarity-Difference**
	Geometry	draw geometrical figures with the help of instruments; calculate perimeter and area of basic geometrical figures and circumference of circles; name, classify and draw angles and triangles; draw expansions of simple solids.	**Change System Space–Time Individual-Group/ Element-Set Similarity-Difference Classification**
	Gathering and processing data	develop an understanding of the concept of ordered pair; be able to read, interpret and create graphs, bar charts, pictographs and tabulate data; become familiar with the concept of probability, make predictions and calculate mean.	**Change System Space–Time Individual-Group/ Element-Set Similarity-Difference Probability**

6th	Numbers and operations	count orally, read, write and order natural numbers, fractions and decimals and use them in numerical operations; learn which numbers are divided by 2, 3, 4, 5, 9, 10 and 25; analyse natural numbers in prime factors and powers.	**System** **Individual-** **Group/ Ele-** **ment-Set** **Similarity–** **Difference** **Analysis-** **synthesis**
	Measurement	consolidate knowledge of standard measurement units of length, area, mass, time and capacity and be able to apply these measurements in every day life; state rules for simple numerical or geometrical patterns.	**Change** **System** **Space–Time** **Individual-** **Group/ Ele-** **ment-Set** **Similarity–** **Difference**
	Geometry	design rectilinear figures and circles using ruler and compass; calculate circumference and area of circles as well as area and volume of solids; draw and compare angles; draw reflective figures; use rules of reflective symmetry; translate and scale up or down geometrical figures.	**Change** **System** **Space–Time** **Individual-** **Group/ Ele-** **ment-Set** **Similarity–** **Difference** **Symmetry**
	Gathering and processing data	collect and record data;	**Change** **System**

	Statistics	create data tables and graphs (bar charts, histograms); report data on graphs orally or in the form of written paragraph; transfer data from text to table or graph make predictions; understand the concept of the ordered pair and calculate mean.	**Communication** **Space–Time** **Individual-** **Group/ Ele-** **ment-Set** **Similarity-** **Difference**
	Ratios and pro-portions	use proportional reasoning to solve problems ("Simple Method of Three"); understand and apply ratios, proportions and percentages.	**System** **Individual-** **Group/ Ele-** **ment-Set** **Similarity-** **Difference**
	Equations	solve simple equations based on operation definitions.	**System** **Individual-** **Group/ Ele-** **ment-Set** **Similarity-** **Difference**

II. Junior High school

Grade	Content Guiding Principles	Goals (Knowledge, skills, attitudes, and values)	Indicative Fundamental Cross-thematic Concepts
1st	**Arithmetic-Algebra** Arithmetic and algebraic calculus	**Pupils should**: develop fluency in operations of natural numbers, fractions and decimals and use their properties to solve equations and problems; develop an understanding of negative rational numbers and be able to solve equations and problems involving rational numbers in general.	**Group/Set** **System** **Change** **Communication** **Equality** **Equivalence**
	Proportions Direct and Inverse proportion	apply ratios as well as direct and inverse proportion to solve problems from everyday life situations (e.g. percentages, distribution , etc).	**Similarity** **Change** **System** **Interaction**
	Geometry Geometrical concepts Geometrical figures	become familiar with basic geometrical concepts like point, segment, straight line, angle, rectilinear figure, circle, arc (of a circle), central angle, etc and understand their importance in Geometry; understand perpendicularity, parallelism and reflective or rotational symmetry and use them to analyse mathematical situations (e.g. properties of triangles, parallelograms, etc).	**Space-Time** **Group/Set** **System** **Change** **Communication** **Culture** **Art** **Similarity–Difference**

		Measurement	understand the concepts of length of segment and measure of angle and arc, using appropriate units of measurement.	**Change** **Interaction** **Space-Time** **Similarity– Difference**
2nd		**Algebra- Statistics** Algebraic Calculus	understand operations and properties of irrational and real numbers and be able to use them to solve problems involving linear equations and inequalities.	**Group/Set** **Communication** **Change** **Similarity– Difference**
		Functions	develop an initial conceptual understanding of functions; interpret and translate among tabular, symbolic and graphical representations of functions; use different representations of functions $y = ax$ and $y = \dfrac{a}{x}$ to solve problems in everyday life situations (e.g. direct and inverse proportion, etc.).	**Interaction** **Communication** **Change** **Similarity– Difference** **Culture**
		Statistics	read, understand and interpret statistical representations (tables, graphs, diagrams); collect, organize and display statistical data and draw conclusions.	**Group** **Interaction** **Communication** **Change** **System**
		Geometry Geometrical concepts Geometrical fig-	develop an understanding of the concept of angle inscribed in a circle and of the regular polygons and their role in measuring circumference and cir-	**Space-Time** **Communication** **Similarity– Difference**

	ures	cular area; recognize basic solids (prism, cylinder, pyramid, cone and sphere) and understand their properties.	**System**
	Measurement	understand units of measurement for area and volume; measure area of plane figures and solids; measure volume of solids (prism, cylinder, cone and sphere).	**Interaction** **Communication** **Similarity–** **Difference** **System**
	Trigonometry-Vectors	develop an understanding of trigonometric numbers of oblique angles and how they are related; understand vectors; add and subtract vectors; analyze vectors in two perpendicular components.	**Similarity** **Change** **System** **Interaction**
3rd	**Algebra-Statistics** Algebraic Calculus	develop an uunderstanding of algebraic expressions and especially monomials, polynomials and rational expressions and their properties and be able to perform operations; understand the basic algebraic formulas; be able to factorize and simplify al-	**Communication** **Similarity–** **Difference** **System**

		gebraic expressions.	
	Equations– inequalities- systems	solve, both algebraically and graphically, simple and quadratic equations, simple inequalities and linear systems.	**Interaction** **Similarity– Difference** **Equality** **System**
	Functions	apply different representations of function $y = ax^2 + bx + c$ in problem solving.	**Interaction** **Change** **Similarity– Difference**
	Probability	understand and apply the basic concepts and laws of theoretical probability (sample space, event, classical definition of probability).	**Group/Set** **Communication** **System** **Probability**
	Geometry Geometrical concepts Geometrical figures	understand and apply congruency, and especially equal triangles to solve geometrical problems; understand ratios, Thales theorem, figure similarity and especially triangle similarity and apply them to solve everyday life problems.	**Space-Time** **Communication** **Similarity– Difference** **Culture** **System**
	Trigonometry Sine, Cosine and Tangent Ratios	develop an understanding of sine, cosine and tangent of an angle not greater than 360° and their relations; understand sine and cosine rules and apply them to solve triangle problems.	