

MATHEMATICS SYLLABUS

Forms 4 and 5 Track 1

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Mathematics Syllabus
Form 4 Track 1

Form IV – Track 1: Number and Applications (i)

SMP Interact Mathematics for Malta: Foundation Level

Ch	Mod	Learning Outcome:	Pg	Level	Notes
4	NN31	i. Know what each digit represents in a given number.	28		<ul style="list-style-type: none"> Students are expected to work out, without using pencil and paper or a calculator, simple computations, and to solve simple problems. E.g. smallest first, increasing order of size, etc. E.g. nearest unit, nearest 10 up to nearest 1 000 000. E.g. 732×28
	NN31	ii. Write in a given order a set of numbers.			
	NN31	iii. Round numbers to a given degree of accuracy.			
	NN31	iv. Round numbers correct to one significant figure.			
	NN31	v. Multiply and divide numbers by numbers ending with zeros.			
	NN31	vi. Carry out rough estimates to check accuracy.			
5	NN31	vii. Convert large metric units to smaller metric units and vice versa.	33		<ul style="list-style-type: none"> To include units of length, capacity (<i>l</i>, <i>ml</i>, cm^3) and weight and simple problems connected with these.
14	NN31	viii. Work out problems using metric units.	92		
7	NN32	i. Read decimal numbers to two decimal places from scales.	41		<ul style="list-style-type: none"> To include decimal numbers. For example fitting in an envelope or inserting a number in a given range.
	NN32	ii. Arrange numbers in ascending and descending order of size.			
	NN32	iii. Use the notion of limits in simple cases.			
11	NA33	i. Estimate height by comparing against a known length.	73		
	NA33	ii. Read and use scales in practical situations.			
14	NN34	i. Round numbers and quantities to the nearest unit.	89		<ul style="list-style-type: none"> To include decimal numbers.
	NN34	ii. Round to one and more than one decimal place.			
	NN34	iii. Multiply and divide by powers of ten.			

Form IV - Track 1: Number and Applications (ii)

SMP Interact Mathematics for Malta: Foundation Level

Ch	Mod	Learning Outcome:	Pg	Level	Notes
21	NN35	i. Recognise multiples, factors and prime numbers.	138		
	NN35	ii. Identify a common factor and a common multiple of two numbers.			
	NN35	iii. Find perfect squares and perfect square roots without using calculators.			
	NN35	iv. Find perfect cubes without using a calculator.			
22	NN35	v. Use factors to multiply and divide by 4 and 5 mentally.	144		
27	NA36	i. Apply notions of directed number to practical situations.	179		<ul style="list-style-type: none"> To include evaluating simple expressions of addition, subtraction and multiplication by substituting one variable by a directed number.
	NN36	ii. Compare the magnitude of two or more integers.			
	NN36	iii. Add negative numbers.			
	NN36	iv. Subtract negative numbers.			
	NN36	v. Multiply directed numbers by a positive number.			
28	NA37	i. Change percentages to fractions / decimals and vice-versa.	186		
	NA37	ii. Work out the percentage of a quantity.			
37	NN38	i. Round numbers, including decimals, to one significant figure.	260		E.g. $\frac{21.82 \times 3.921}{3.72}$
	NN38	ii. Multiply decimal numbers.			
	NN38	iii. Carry out rough estimates to check accuracy.			
	NN38	iv. Round numbers, including decimals, to one and more than one decimal place.			
39	NA39	i. Work with quantities in a given proportion.	278		E.g. Use recipes and make comparisons by using unit costs.
	NN39	ii. Use the ratio notation to compare two or more quantities.			
	NA39	iii. Solve problems involving direct proportion using ratio and the unitary method.			
	NA39	iv. Mix quantities in a given ratio.			
	NN39	v. Write ratios in their simplest form.			
	NA39	vi. Share quantities in a given ratio.			

Form IV – Track 1: Algebra

SMP Interact Mathematics for Malta: Foundation Level

Ch	Mod	Learning Outcome:	Pg	Level	Notes
15	AL18	i. Use simple formulae by substituting numbers for the unknown.	95		E.g. Function machines.
32	AL19	i. Simplify algebraic expressions by collecting like terms.	219		
	AL19	ii. Form expressions and formulae.			
35	AL20	i. Generate and plot coordinate pairs that satisfy a simple linear rule/equation.	244		
	AL20	ii. Draw straight-line graphs from linear equations.			
	AL20	iii. Use straight-line graphs to find the value of one coordinate given the other.			
42	AL21	i. Solve linear equations in one unknown involving two or more operations.	306		<ul style="list-style-type: none"> • Solve equations by the balancing method.
	AL21	ii. Construct and solve simple linear equations.			<ul style="list-style-type: none"> • Exclude equations involving brackets and fractions
	AL21	iii. Form and solve equations in one unknown to solve problems.			
46	AL22	i. Evaluate simple expressions and formulae by substituting numbers for the unknown.	341		E.g. Function machines- arrow diagram.
	AL22	ii. Construct and use simple formulae/linear equations.			<ul style="list-style-type: none"> • Students should be given opportunities to use a spreadsheet and/or a CAS to explore algebraic relationships.
	AL22	iii. Evaluate simple formulae with two or more positive inputs.			
70	AL23	i. Use conversion graphs.	536		<ul style="list-style-type: none"> • Students are not required to draw conversion graphs.

Form IV – Track 1: Shape, Space and Measurement

SMP Interact Mathematics for Malta: Foundation Level

Ch	Mod	Learning Outcome:	Pg	Level	Notes
5	GM20	i. Use metric units of length, mass and capacity.	33		<ul style="list-style-type: none"> To include $1\text{ml} = 1\text{cm}^3$ and $1\text{litre} = 1000\text{ml} = 1000\text{cm}^3$
8	GG21	i. Identify and draw shapes having reflection symmetry.	48		<ul style="list-style-type: none"> Limited to shapes in 2D only.
	GG21	ii. Understand the symmetrical properties of a regular polygon.			
	GG21	iii. Determine the order of rotational symmetry.			
	GG21	iv. Identify shapes having rotational symmetry.			
23	GG22	i. Solve problems involving angles at a point, angles on a straight line and vertically opposite angles.	145		<ul style="list-style-type: none"> To include alternate and corresponding angles. Only an outline notion is required with one step statements. Proofs of geometric statements from geometric diagrams will not be required.
	GG22	ii. Identify parallel lines in geometric figures.			
	GG22	iii. Solve problems involving parallel lines.			
	GG22	iv. Give reasons for deducing true statements from geometric diagrams.			
25	GG23	i. Draw different views of a given solid.	160		<ul style="list-style-type: none"> To draw the plan, front and side view of a solid on squared paper.
	GG23	ii. Identify a prism and draw its uniform cross section.			
	GG23	iii. Identify and construct the net of a cuboid, triangular prism and square based right pyramid.			
29	GM24	i. Know and understand the meaning of terms related to the circle: centre, radius, diameter and circumference.	194		<ul style="list-style-type: none"> Discover through practical activity that as ratio of circumference to diameter π is approximately equal to 3. Learn to use the π key on the calculator.
	GM24	ii. Understand the notion of π .			
	GM24	iii. Work out the circumference of a circle using π as a multiplier.			
31	GM25	i. Derive and use the formula for the area of a parallelogram.	211		<ul style="list-style-type: none"> Use squared paper to demonstrate that the area of a parallelogram is equal to that of a rectangle on an equal base and having the same perpendicular height. Identify the perpendicular height with respect to a given side.
40	GM26	i. Derive the formula $\frac{1}{2} \times \text{base} \times \text{perpendicular height}$ for the area of a triangle.	291		
	GM26	ii. Use the formula for the area of a triangle in composite shapes.			

Form IV – Track 1: Data Handling

SMP Interact Mathematics for Malta : Foundation Level

Ch	Mod	Learning Outcome:	Pg	Level	Notes
2	DH10	i. Interpret information tables.	12		<ul style="list-style-type: none"> Understanding the difference between discrete and continuous data is not expected.
	DH10	ii. Read line graphs and bar charts.			
	DH10	iii. Construct ungrouped frequency tables.			
	DH10	iv. Understand, compute and interpret the mean, mode and range of a set of data.			
20	DH11	i. Group data and compile grouped frequency tables.	134		<p>Students should be given opportunities</p> <ul style="list-style-type: none"> To formulate questions about relevant issues and answer these questions by collecting data and presenting it in meaningful ways. To use spreadsheets to display and analyse the collected data. It is important that pupils not only learn how to compute statistics but understand their scope and drawbacks. Learn to group data in a meaningful way.
	DH11	ii. Draw bar charts for grouped data.			
30	DH11	iii. Collect, classify and tabulate statistical data.	204		
36	DH12	i. Find the probability by experiment.	251		
	DH12	ii. Understand and work out the probability of an event.			

Mathematics Syllabus
Form 5 Track 1

Form V - Track 1: Number and Applications

SMP Interact Mathematics for Malta: Foundation Level

Ch	Mod	Learning Outcome:	Pg	Level	Notes
44	NN40	i. Multiply directed numbers by a negative number.	328		<ul style="list-style-type: none"> To include evaluating expressions with up to three variables.
	NN40	ii. Divide directed numbers by a negative number.			
	NN40	iii. Work out cases of mixed calculations.			
47	NA41	i. Change percentages to fractions and vice-versa.	351		
	NA41	ii. Find the percentage of a quantity.			
	NA41	iii. Express one quantity as a percentage of another.			
	NA41	iv. Solve problems on everyday use of percentages.			
49	NN42	i. Make efficient use of a calculator relating to basic functions (+, -, ×, ÷, =).	365		
	NN42	ii. Apply basic functions in problem solving.			
	NN42	iii. Present necessary working in orderly form.			
60	NN43	i. Reduce fractions to their lowest terms.	459		<ul style="list-style-type: none"> To include adding and subtracting two mixed numbers. Write fractions in ascending and descending order of size.
	NN43	ii. Change improper fractions to mixed numbers and vice-versa.			
	NN43	iii. Add and subtract two fractions with different denominators			
	NN43	iv. Multiply one fraction by a whole number.			
	NN43	v. Compare two fractions according to size.			
63	NN44	i. Make efficient use of a calculator relating to change sign, reciprocal and brackets	487		
	NN44	ii. Make efficient use of a calculator to find squares, cubes and square roots.			
65	NN45	i. Multiply two decimal numbers without using a calculator.	504		<ul style="list-style-type: none"> To include applications in conversions, bills and area.
67	NN46	i. Find a fraction of a quantity.	516		<ul style="list-style-type: none"> Learn to use the fraction key on the calculator.
	NN46	ii. Divide a fraction by a whole number.			
	NN46	iii. Multiply a fraction by another fraction.			
69	NA47	i. Work out the percentage increase/decrease.	528		<ul style="list-style-type: none"> To include examples on sale, discounts, simple interest, VAT, appreciation, depreciation and other everyday situations.
	NA47	ii. Solve problems involving percentage increase and decrease.			

Form V – Track 1: Algebra

SMP Interact Mathematics for Malta: Foundation Level

Ch	Mod	Learning Outcome:	Pg	Level	Notes
50	AL24	i. Factorise expressions by taking out a single numeric/algebraic common factor.	371		E.g. $2(a+3) \pm (3(a-1))$
	AL24	ii. Multiply a single term over a bracket.			
	AL24	iii. Simplify algebraic expressions by collecting like terms including simple use of brackets.			
58	AL25	i. Recognize geometric and number patterns.	449		<ul style="list-style-type: none"> Opportunity should be given to generate number patterns on a spreadsheet. E.g. which term contains 100 dots in a geometric pattern?
	AL25	ii. Describe simple patterns by a verbal rule.			
	AL25	iii. Find the next term or pattern in a sequence.			
	AL25	iv. Extend patterns and sequences of numbers to find a term of a sequence.			
	AL25	v. Finding which term fits a given description in a geometric pattern			
61	AL26	i. Use simple formulae by substituting numbers for the unknown including brackets and fractions.	468		
	AL26	ii. Solve problems leading to solution of linear equations in one unknown.			
63	AL27	i. Use a calculator to work out positive integral indices.	490		
66	AL28	i. Solve linear equations in one unknown involving two or more operations	510		<ul style="list-style-type: none"> Include the use of brackets and simple fractions with numerical denominators.
	AL28	ii. Solve problems leading to solution of linear equations in one unknown.			
70	AL29	i. Draw and use conversion graphs.	536		

Form V – Track 1: Shape, Space and Measurement (i)

SMP Interact Mathematics for Malta: Foundation Level

Ch	Mod	Learning Outcome:	Pg	Level	Notes
38	GG27	i. Find unknown angles in general triangles.	268		<ul style="list-style-type: none"> Students should be given the opportunity to use LOGO and Dynamic Geometry Software to investigate the properties of quadrilaterals and regular polygons. Students are expected to use a formula such as $(2n - 4)$ right angles and $(n - 2) \times 180^\circ$ to find the sum of the interior angles of a polygon.
	GG27	ii. Derive the sum of the angles of a quadrilateral from the angles of a triangle.			
	GG27	iii. Solve problems involving the angles of quadrilateral.			
	GG27	iv. Draw the inscribed regular hexagon in a given circle using ruler and compasses only.			
	GG27	v. Construct regular polygons inside a circle using the angle at the centre subtended by the sides and using a protractor.			
	GG27	vi. Derive the sum of the exterior angles of a polygon.			
	GG27	vii. Derive the sum of the interior angles of a polygon.			
51	GG28	i. Draw simple scale drawings from given data and interpret scale drawings.	378		<ul style="list-style-type: none"> Exclude making a scale drawing using bearings.
	GG28	ii. Use three-figure bearings to describe the position of one point from another.			
	GG28	iii. Find the distance/bearing of one object from another by reading a scale drawing.			
55	GM29	i. Work out the volume of a cuboid by counting cubes/using formula.	423		
	GM29	ii. Use the formula $V = l \times b \times h$ to find length, breadth or height.			
	GM29	iii. Solve problems involving the volume of a cube or cuboids.			
	GM29	iv. Understand and use units of volume in cm^3 and m^3 and be able to convert units in simple cases.			
	GM29	v. Work out the surface area of a right prism by drawing and measurement.			

Form V – Track 1: Shape, Space and Measurement (ii)

SMP Interact Mathematics for Malta: Foundation Level

Ch	Mod	Learning Outcome:	Pg	Level	Notes
56	GM30 GM30 GM30 GM30 GM30 GM30	i. Use the formula Circumference = πd ii. Estimate the areas of awkward shapes by counting squares. iii. Use the formula $A = \pi r^2$ for the area of a circle. iv. Find the area of composite shapes: dividing them into simple shapes including circles. v. Find the length of arc and area of sector as fractions of a circle. vi. Solve problems involving the area and the circumference of a circle.	431		<ul style="list-style-type: none"> Students should be able to demonstrate, by taking circles with different radii, that the area of a circle is approximately equal to 3 times the area of the square drawn with the radius of the circle. For half, quarter and three-quarters of a circle.
59	GG31 GG31	i. Enlarge a shape given the centre of enlargement and the scale factor. ii. Understand the effects of enlargement.	454		<ul style="list-style-type: none"> Understand and use the effect of enlargement on perimeter for 2D shapes. Exclude the effect on the area of the shape.
64	GG32 GG32 GG32 GG32 GG32 GG32 GG32	Draw: i. Reflections. ii. Translation. iii. Rotations. iv. Enlargement. v. Transform 2D shapes by a combination of transformations. vi. Understand the notion of similarity through enlargement. vii. Understand the notion of congruent shapes.	492		<ul style="list-style-type: none"> Use $y = \pm c$, $x = \pm c$ as axes. Use right, left, up and down descriptions in the x, y plane. Use angles of rotation in multiples of 90°. Use positive integers as scale factors. Recognise that reflections, rotations and translations preserve length and angle, so that any figure is congruent to its image under any of these transformations.
68	GG33 GG33	Construct triangles, using ruler and compasses only: i. Given the length of the sides, ii. Given the length of one side and two angles, iii. Given two sides and the included angle.	523		<ul style="list-style-type: none"> Exclude the ambiguous case.

Form V – Track 1: Data Handling

SMP Interact Mathematics for Malta: Foundation Level

Ch	Mod	Learning Outcome:	Pg	Level	Notes
52	DH13	i. Read pie charts.	387		
	DH13	ii. Draw pie charts using angles to create sectors.			
57	DH14	i. Group data and compile grouped frequency tables	439		<ul style="list-style-type: none"> • Exclude the use of inequality signs in grouping data. • Understanding the difference between discrete and continuous data is not expected. • For further exercises on the median and range see Chapter 20 Pg. 131
	DH14	ii. Understand, compute and interpret the mean, mode, median and range of a set of ungrouped data.			
	DH14	iii. Understand, compute and interpret the modal group of a set of grouped data.			
36	DH15	i. Compile a possibility space and use it to work the probability of an outcome.	253		