SEKOLAH MENENGAH SAINS SULTAN MAHMUD

YEARLY LESSON PLAN

MATHEMATICS

FORM 3

TAHUN 2021

LEARNING AREA: NUMBERS AND OPERATIONS **CHAPTER 1: INDICES**				
WEEK	**CONTENT STANDARDS**	**LEARNING STANDARDS**	**SUGGESTED ACTIVITIES/NOTES**	**PERFORMANCE LEVEL/ DESCRIPTOR**
W 1 (20. 1. 21 - 22. 1. 21) **W 2** (24. 1. 21 - 30. 1. 21) Notes : Thaipusam (28. 1. 21) **W 3** (31. 1. 21 - 6. 2. 21)	1.1 Index Notation	Pupils are able to: 1.1.1 Represent repeated multiplication in index form and describe its meaning. 1.1.2 Rewrite a number in index form and vice versa.	Note: The terms “base” and “index” need to be introduced.	1 Demonstrate the basic knowledge of index form. 2 Demonstrate the understanding of index form. 3 Apply the understanding of laws of indices to perform simple tasks. 4 Apply appropriate knowledge and skills of laws of indices in the context of simple routine problem solving. 5 Apply appropriate knowledge and skills of laws of indices in the context of complex routine problem solving. 6 Apply appropriate knowledge and skills of laws of indices in the context of non-routine problem solving in a creative manner.
	1.2 Law of Indices	Pupils are able to: 1.2.1 Relate the multiplication of numbers in index form with the same base, to repeated multiplications, and hence make generalisation. 1.2.2 Relate the division of numbers in index form with the same base, to repeated multiplications, and hence make generalisation. 1.2.3 Relate the numbers in index form raised to a power, to repeated multiplication, and hence make generalisation. 1.2.4 Verify that $a^0 = 1$ and $a^{-n} = \frac{1}{a^n}$; $a \neq 0$. 1.2.5 Determine and state the relationship between fractional indices and roots and powers. 1.2.6 Perform operations involving laws of indices. 1.2.7 Solve problems involving laws of indices.	Note: Exploratory activities which only involve integer indices need to be carried out for SP 1.2.1, 1.2.2 and 1.2.3. Index is also known as exponent or power. Note: $a^{\frac{1}{n}} = \sqrt[n]{a}$ $a^{\frac{m}{n}} = (a^m)^{\frac{1}{n}} = (a^{\frac{1}{n}})^m$ $a^{\frac{m}{n}} = \sqrt[n]{a^m} = (\sqrt[n]{a})^m$	

LEARNING AREA: NUMBERS AND OPERATIONS **CHAPTER 2: STANDARD FORM**				
HEBAT Resource Material: MODUL 22: FRACTION AND DECIMAL				
WEEK	**CONTENT STANDARDS**	**LEARNING STANDARDS**	**SUGGESTED ACTIVITIES/NOTES**	**PERFORMANCE LEVEL/ DESCRIPTOR**
W 4 (7. 2. 21 - 11. 2. 21) Notes : CNY (12 & 13 Feb. 2021)	2.1 Significant Figures	Pupils are able to: 2.1.1 Explain the meaning of significant figure, and hence determine the number of significant figures of a number. 2.1.2 Round off a number to certain numbers of significant figures.	Notes: Exploratory activities including those involving estimation, approximation and accuracy in real life situations need to be carried out. Cases of whole numbers involving zero after nonzero digit need to be discussed.	1 Demonstrate the basic knowledge of significant figures and standard form. 2 Demonstrate the understanding of significant figures and standard form. 3 Apply the understanding of significant figures and standard form to perform simple tasks. 4 Apply appropriate knowledge and skills of standard form in the context of simple routine problem solving. 5 Apply appropriate knowledge and skills of standard form in the context of complex routine problem solving. 6 Apply appropriate knowledge and skills of standard form in the context of non-routine problem solving in a creative manner.
	2.2 Standard Form	Pupils are able to: 2.2.1 Recognise and write numbers in standard form. 2.2.2 Perform basic arithmetic operations involving numbers in standard form. 2.2.3 Solve problems involving numbers in standard form.	Notes: The use of standard form in real life including common prefix such as tera and nano need to be explored, with and without the use of technological tools. The relationship between standard form and laws of indices and significant figures need to be discussed. Notes: Solutions involving factorisation need to be carried out.	

LEARNING AREA: NUMBERS AND OPERATIONS **CHAPTER 3: CONSUMER MATHEMATICS: SAVINGS AND INVESTMENTS, CREDIT AND DEBT**				
WEEK	**CONTENT STANDARDS**	**LEARNING STANDARDS**	**SUGGESTED ACTIVITIES/NOTES**	**PERFORMANCE LEVEL/ DESCRIPTOR**
W 5 (15. 2. 21 - 20. 2. 21)	3.1 Savings and Investments	Pupils are able to: 3.1.1 Recognise various types of savings and investments. 3.1.2 Perform calculations involving simple interest and compound interest for savings, and hence explain the impact of changes in period, rate of interest or return and compounding frequency on the future value of savings	Notes: Exploratory activities of the types of savings and investments, and the types of interests (simple and compound) involved, need to be carried out. Types of savings: • Saving account • Fixed deposit account • Current account Types of investments: • Shares • Unit trust • Real estate Notes: For savings which give simple interest, use the formula: $I = Prt$ I = interest P= principal r = rate t= time Suggested activity:	1 Demonstrate the basic knowledge of savings, investments, credit and debt. 2 Demonstrate the understanding of savings, investments, credit and debt. 3 Apply the understanding of savings, investments, credit and debt to perform simple tasks. 4 Apply appropriate knowledge and skills of savings, investments, credit and debt in the context of simple routine problem solving. 5 Apply appropriate knowledge and skills of savings, investments, credit and debt in the context of complex routine problem solving. 6 Apply appropriate knowledge and skills of savings, investments, credit and debt in the context of nonroutine

			Derivation of simple interest and total saving formulae are encouraged.	problem solving in a creative manner.

WEEK	CONTENT STANDARDS	LEARNING STANDARDS	SUGGESTED ACTIVITIES/NOTES	PERFORMANCE LEVEL/ DESCRIPTOR
			Notes: For savings which give compound interest, use the formula: $MV = P(1+\frac{r}{n})^{n}$ MV = matured value Matured value is the total of principal and interest. P = principal r = yearly interest rate n = number of periods the interest is compounded per year t = term in years For islamic banking, the rate of return is only as reference. The real rate of return will only be known at maturity or on the date the money is withdrawn.	
		3.1.3 Perform calculations involving the value of return of investments, and hence explain the factors that affect the return of investments and its impacts.	Notes: Return of investment (ROI) and dividend of unit trust need to be involved. Real estate investments need to involve the rate of return and the real rate of return.	

W 6 (21. 2. 21 - 25. 2.2 1) Notes : Chap Goh Meh (26. 2. 21)		3.1.4 Compare and contrast potential risks, return and liquidity of various types of savings and investments.	Notes: Exploratory activities need to be carried out. Involve situations which require pupils to make wise decisions in the contexts of savings and investments, and give justifications.	

WEEK	CONTENT STANDARDS	LEARNING STANDARDS	SUGGESTED ACTIVITIES/NOTES	PERFORMANCE LEVEL/ DESCRIPTOR
		3.1.5 Calculate the average cost per share for the investment of shares using the ringgit cost averaging strategy and explain the benefits of the strategy. 3.1.6 Solve problems involving savings and investments.	Notes: Shares including unit trust.	
W 7 (28. 2. 21 - 6. 3. 21)	3.2 Credit and Debt Management	Pupils are able to: 3.2.1 Explain the meaning of credit and debt, and hence describe the wise management of credit and debt.	Notes: Exploratory activities need to be carried out. Instant loan need to be discussed. Credit including credit cards and loans.	
		3.2.2 Investigate and describe the advantages and disadvantages of credit card and ways to use it wisely.	Notes: Involving: (a) Incentive system (b) Qualifications to obtain credit cards (c) User responsibilities (d) Security aspects (e) Common charges	
		3.2.3 Investigate and describe the impact of minimum and late payments for credit card usage.	Finance charges calculations need to be involved.	

W 8 (7. 3. 21 - 13. 3. 21) Notes : Israk & Mikraj (11. 3. 21)		3.2.4 Solve problems involving the use of credit cards.	Emphasise on the interest on debts. Situations which require pupils to make wise decisions in the contexts of credit card expenditures and payments, and give justifications need to be involved.	
WEEK	**CONTENT STANDARDS**	**LEARNING STANDARDS**	**SUGGESTED ACTIVITIES/NOTES**	**PERFORMANCE LEVEL/ DESCRIPTOR**
Still **W 8** (7. 3. 21 - 13. 3. 21)		3.2.5 Calculate the total amount of loan repayment and instalment, with various interest rates and different loan periods. 3.2.6 Solve problems involving loans.	Problems include currency exchange and online purchases. Notes: Formula for loan with flat interest: $A = P + Prt$ A = total repayment P = principal r = rate t = time Loans with flat interest, such as car loan, personal loan and consumer goods loan. Interest on debts need to be discussed. Notes: Situations which require pupils to make wise decisions and give justifications need to be	

			involved.	

LEARNING AREA: MEASUREMENT AND GEOMETRY **CHAPTER 4: SCALE DRAWINGS**				
WEEK	**CONTENT STANDARDS**	**LEARNING STANDARDS**	**SUGGESTED ACTIVITIES/NOTES**	**PERFORMANCE LEVEL/ DESCRIPTOR**
W 9 (14. 3. 21 - 20. 3. 21)	4.1 Scale Drawings	Pupils are able to: 4.1.1 Investigate and explain the relationship between the actual measurements and the measurements of various sizes of drawings of an object, and hence explain the meaning of scale drawing. Real life situations need to be involved. 4.1.2 Interpret the scale of a scale drawing. 4.1.3 Determine the scales, measurements of objects or measurements of scale drawings. 4.1.4 Draw the scale drawings of objects and vice versa. 4.1.5 Solve problems involving scale drawings.	Notes: The concept of proportion needs to be emphasised. Notes: Scales are in the form of 1: n or 1: $\frac{1}{n}$ when n = 1, 2, 3, ... Notes: Grids of various sizes need to be involved. Suggested activity: Project work is encouraged.	1 Demonstrate the basic knowledge of scale drawings. 2 Demonstrate the understanding of scale drawings. 3 Apply the understanding of scale drawings to perform simple tasks. 4 Apply appropriate knowledge and skills of scale drawings in the context of simple routine problem solving. 5 Apply appropriate knowledge and skills of scale drawings in the context of complex routine problem solving. 6 Apply appropriate knowledge and skills of scale drawings in the

				context of non-routine problem solving in a creative manner.
W 10 (21. 3. 21 - 27. 3. 21)		**MONTHLY TEST 1**		
(28. 3. 21 - 3. 4. 21)		**SCHOOL HOLIDAYS**		

LEARNING AREA: MEASUREMENT AND GEOMETRY **CHAPTER 5: TRIGONOMETRIC RATIOS**				
HEBAT Resource Material: MODULE 30 : TRIGONOMETRY				
WEEK	**CONTENT STANDARDS**	**LEARNING STANDARDS**	**SUGGESTED ACTIVITIES/NOTES**	**PERFORMANCE LEVEL/ DESCRIPTOR**
W 11 (4. 4. 21 - 10. 4. 21) **W 12** (11. 4. 21 - 17. 4. 21)	5.1 Sine, Cosine and Tangent of Acute Angles in Right-angled Triangles	Pupils are able to: 5.1.1 Identify the opposite side and adjacent side based on an acute angle in a right-angled triangle. 5.1.2 Make and verify the conjecture about the relationship between acute angles and the ratios of the sides of right-angled triangles, and hence define sine, cosine and tangent. 5.1.3 Make and verify the conjecture about the impact of changing the size of the angles on the values of sine, cosine and tangent.	Notes: Connection with the concept of proportion needs to be done. Notes: The impacts of changes need to be explained using the ratios of the sides of right-angled triangles.	1 Demonstrate the basic knowledge of the sides of right-angled triangles based on an acute angle. 2 Demonstrate the understanding of sine, cosine and tangent. 3 Apply the understanding of sine, cosine and tangent to perform simple tasks. 4 Apply appropriate knowledge and skills of sine, cosine and tangent in the context of simple routine problem solving.

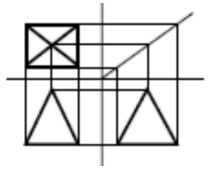
		5.1.4 Determine the values of sine, cosine and tangent of acute angles. 5.1.5 Determine the values of sine, cosine and tangent of 30°, 45° and 60° angles without using a calculator.	Angles of 0° and 90° need to be involved. Notes: The relationship of tan θ = $\frac{sin\theta}{coscos\ \theta}$ needs to be explored. Notes: Surd form needs to be involved.	5 Apply appropriate knowledge and skills of sine, cosine and tangent in the context of complex routine problem solving. 6 Apply appropriate knowledge and skills of sine, cosine and tangent in the context of non-routine problem solving in a creative manner.

WEEK	CONTENT STANDARDS	LEARNING STANDARDS	SUGGESTED ACTIVITIES/NOTES	PERFORMANCE LEVEL/ DESCRIPTOR
W 13 (18. 4. 21 - 24. 4. 21)		5.1.6 Perform calculations involving sine, cosine and tangent. 5.1.7 Solve problems involving sine, cosine and tangent.	Notes: The notations of $\sin^{-1}$, $\cos^{-1}$ and $\tan^{-1}$ need to be used. Notes: Problems include 3D geometrical objects, angles of elevation and angles of depression.	
LEARNING AREA: MEASUREMENT AND GEOMETRY **CHAPTER 6: ANGLES AND TANGENTS OF CIRCLES**				
W 14 (25. 4. 21	6.1 Angle at the Circumference and Central	Pupils are able to: 6.1.1 Make and verify conjectures about the relationships between (i) angles at the circumference,	Notes: Various methods including the use of dynamic softwares need to be used.	1 Demonstrate the basic knowledge of angles in circles, cyclic quadrilaterals and tangents to circles.

- 01. 5. 21)	Angle Subtended by an Arc	(ii) angles at the circumference and central angle subtended by particular arcs, and hence use the relationships to determine the values of angles in circles. 6.1.2 Solve problems involving angles in circles.	6.1.1 (ii) include “angles in a semicircle”.	2 Demonstrate the understanding of angles in circles, cyclic quadrilaterals and tangents to circles. 3 Apply the understanding of angles in circles, cyclic quadrilaterals and tangents to circles to perform simple tasks.

WEEK	CONTENT STANDARDS	LEARNING STANDARDS	SUGGESTED ACTIVITIES/NOTES	PERFORMANCE LEVEL/ DESCRIPTOR
W 15 (2. 5. 21 - 8. 5. 21)	6.2 Cyclic Quadrilaterals	Pupils are able to: 6.2.1 Recognise and describe cyclic quadrilaterals. 6.2.2 Make and verify conjectures about the relationships between angles of cyclic quadrilaterals, and hence use the relationships to determine the values of angles of cyclic quadrilaterals. 6.2.3 Solve problems involving cyclic quadrilaterals.	Notes: Various methods including the use of dynamic softwares need to be involved.	4 Apply appropriate knowledge and skills of angles and tangents to circles in the context of simple routine problem solving. 5 Apply appropriate knowledge and skills of angles and tangents to circles in the context of complex routine problem solving. 6 Apply appropriate knowledge and skills of angles and tangents to circles in the context of non-routine problem solving in a creative manner.
W 16 (9. 5. 21 - 15. 5. 21) **Notes :** Hari Raya Aidilfitri (13 & 14	6.3 Tangents to Circles	Pupils are able to: 6.3.1 Recognise and describe the tangents to circles. 6.3.2 Make and verify conjectures about (i) the angle between tangent and radius of a circle at the point of tangency, (ii) the properties related to two tangents to a circle, (iii) the relationship of angle between tangent and chord with the angle in the alternate	Notes: Various methods including the use of dynamic software need to be involved. Geometrical constructions need to be involved to verify conjectures.	

May 2021)		segment which is subtended by the chord, and hence perform the related calculations. 6.3.3 Solve problems involving tangents to circles.	Notes: Problems of common tangents need to be involved.	
	6.4 Angles and Tangents of Circles	Pupils are able to: 6.4.1 Solve problems involving angles and tangents of circles.		
LEARNING AREA: MEASUREMENT AND GEOMETRY **CHAPTER 7: PLANS AND ELEVATIONS**				
HEBAT Resource Material: MODULE 28 : NET, PLANS & ELEVATIONS				
WEEK	**CONTENT STANDARDS**	**LEARNING STANDARDS**	**SUGGESTED ACTIVITIES/NOTES**	**PERFORMANCE LEVEL/ DESCRIPTOR**
W 17 (16. 5. 21 - 22. 5. 21)	7.1 Orthogonal Projections	Pupils are able to: 7.1.1 Draw orthogonal projections. 7.1.2 Compare and contrast between objects and the corresponding orthogonal projections.	Notes: Views from various directions for vertical and horizontal planes need to be involved. Concrete materials and technological tools such as dynamic softwares need to be used to develop understanding. Notes: Length, angle and shape need to be involved.	1 Demonstrate the basic knowledge of orthogonal projections. 2 Demonstrate the understanding of orthogonal projections. 3 Apply the understanding of plans and elevations to perform simple tasks.
W 18		**MIDDLE YEAR EXAMINATION**	**23 – 27 MAY 2021**	
		SCHOOL HOLIDAYS	**28 MAY – 12 JUNE 2021**	

W 19 (13. 6. 21 - 19. 6. 21)	7.2 Plans and Elevations	Pupils are able to: 7.2.1 Draw the plan and elevations of an object to scale.	Notes: Concrete materials and technological tools such as dynamic softwares need to be used to develop understanding. Drawing the plan and elevations in a diagram by showing the construction lines need to be used. Example: 	4 Apply appropriate knowledge and skills of plans and elevations in the context of simple routine problem solving. 5 Apply appropriate knowledge and skills of plans and elevations in the context of complex routine problem solving. 6 Apply appropriate knowledge and skills of plans and elevations in the context of non-routine problem solving in a creative manner.
WEEK	**CONTENT STANDARDS**	**LEARNING STANDARDS**	**SUGGESTED ACTIVITIES/NOTES**	**PERFORMANCE LEVEL/ DESCRIPTOR**
Still **W 19** (13. 6. 21 - 19. 6. 21)		7.2.2 Synthesise plan and elevations of an object and sketch the object. 7.2.3 Solve problems involving plans and elevations.	Combined objects and original objects partially removed, need to be involved. Types of lines should be emphasised: (a) thick solid line (for visible side). (b) dash line (for hidden side). (c) thin solid line (for construction line). Notes: Technology such as dynamic softwares need to be used to develop understanding. Notes: Project works which involve the followings need to be carried out: (a) construction of models such as building and furniture.	

			(b) calculations such as cost, area and volume. (c) presentation. Integration of STEM elements can be implemented as follows: S – stability in the construction of building structures T – use of software to draw plans and elevations E – design models of building M – calculations of cost, area and volume.	
LEARNING AREA: MEASUREMENT AND GEOMETRY **CHAPTER 8: LOCI IN TWO DIMENSIONS**				
WEEK	**CONTENT STANDARDS**	**LEARNING STANDARDS**	**SUGGESTED ACTIVITIES/NOTES**	**PERFORMANCE LEVEL/ DESCRIPTOR**
W 20 (20. 6. 21 - 26. 6. 21)	8.1 Loci	Pupils are able to: 8.1.1 Recognise loci in real life situations and hence explain the meaning of locus.	Notes: Exploratory activities involving loci in two and three dimensions (such as sphere and cylinder) need to be carried out. Locus is a set of points whose location satisfies certain conditions.	1 Demonstrate the basic knowledge of loci. 2 Demonstrate the understanding of loci. 3 Apply the understanding of loci in two dimensions to perform simple tasks. 4 Apply appropriate knowledge and skills of loci in two dimensions in the context of simple routine problem solving. 5 Apply appropriate knowledge and skills of loci in two dimensions in the context of
W 21	8.2 Loci in Two Dimensions	Pupils are able to: 8.2.1 Describe the locus of points that are of (i) constant distance from a fixed point, (ii) equidistant from two fixed points, (iii) constant distance from a straight line, (iv) equidistant from two parallel lines, and (v) equidistant from two intersecting lines, and hence construct the locus.	Notes: Hands-on activities need to be carried out. Various methods including the use of dynamic softwares need to be used.	

(27. 6. 21 - 3. 7. 21)		8.2.2 Determine the locus that satisfies two or more conditions. 8.2.3 Solve problems involving loci.	Notes: Problems include those involving condition of distance which is more or less than a certain value.	complex routine problem solving. 6 Apply appropriate knowledge and skills of loci in two dimensions in the context of non-routine problem solving in a creative manner

LEARNING AREA: RELATIONSHIP AND ALGEBRA **CHAPTER 9: STRAIGHT LINES**				
HEBAT Resource Material: MODULE 7 : LINEAR EQUATION MODULE 8 : GRAPH FUNCTION MODULE 10 : LINEAR GRAPH FUNCTION MODULE 23 : COORDINATE				
WEEK	**CONTENT STANDARDS**	**LEARNING STANDARDS**	**SUGGESTED ACTIVITIES/NOTES**	**PERFORMANCE LEVEL/ DESCRIPTOR**
W 22 (4. 7. 21 - 10. 7. 21)	9.1 Straight Lines	Pupils are able to: 9.1.1 Make connection between the equation, y = mx+ c, and the gradient and y-intercept, and hence make generalisation about the equation of a straight line. 9.1.2 Investigate and interpret the equations of straight lines in other forms such as ax + by = c and $\frac{a}{x} + \frac{b}{y} = 1$, and change to the form of y = mx + c, and vice versa.	Notes: Explore various graphs of linear functions with and without the use of dynamic softwares. Equations of straight lines which are parallel to $y$axis and x-axis need to be involved. Notes: For $\frac{a}{x} + \frac{b}{y} = 1$, a ≠ 0 and b ≠ 0.	1 Demonstrate the basic knowledge of gradient and y-intercept in the equation of a straight line. 2 Demonstrate the understanding of straight lines. 3 Apply the understanding of straight lines to perform simple tasks. 4 Apply appropriate knowledge and skills of straight lines in the

W 23 (11. 7. 21 - 17. 7. 21) **W 24** (25. 7. 21 - 31. 7. 21)		9.1.3 Investigate and make inference about the relationship between the points on a straight line and the equation of the line. 9.1.4 Investigate and make inference about the gradients of parallel lines. 9.1.5 Determine the equation of a straight line. 9.1.6 Determine the point of intersection of two straight lines. 9.1.7 Solve problems involving straight lines	Notes: Points which are not on the straight line need to be involved. Notes: Determination of point of intersection needs to be explored with and without the use of dynamic softwares. Calculator is **only allowed** to check the answer. Various methods including substitution, elimination and graph need to be involved.	context of simple routine problem solving. 5 Apply appropriate knowledge and skills of straight lines in the context of complex routine problem solving. 6 Apply appropriate knowledge and skills of straight lines in the context of non-routine problem solving in a creative manner.

SECOND MID-TERM HOLIDAYS : 18/07/2021 - 24/07/2021 **Hari Raya Aidil Adha – 20 & 21/07/2021**	
WEEK 25 & 26 : 01/08/2021 – 14/08/2021	**REVISION**
WEEK 27 : 15/08/2021 – 21/08/2021	**PT3 TRIAL EXAMINATION**
WEEK 28 : 22/08/2021 - 28/08/2021	**REVISION** **Awal Muharram - 20/08/2021**
WEEK 29 : 29/08/2021 - 04/09/2021	**REVISION** **Hari Kemerdekaan - 31/08/2021**
WEEK 30 : 05/09/2021 – 11/09/2021	**REVISION** **School Holidays : 11/09/2021 – 19/09/2021 (Hari Malaysia : 16/09/2021)**
WEEK 31 - 38 : 19/09/2021 – 13/11/2021	**REVISION**
WEEK 39 : 15/11/2021 - 19/11/2021	**PT3 EXAMINATION**
WEEK 40 : 21/11/2021 – 27/11/2021	**RETURNING OF SPBT**
WEEK 41 – 42 : 28/11//2021 – 11/12/2021	**UPDATING CLASSROOM-BASED ASSESSMENT (PBD)**

WEEK 43 – WEEK 45 : 12/12/2021 – 31/12/2021	END YEAR HOLIDAYS