UNITED ARAB EMIRATES
MINISTRY OF EDUCATION

الإمــارات العـربيــة المتحـدة
وزارة الـتـربيــة والـتـعـلـيــم

Grade 8 Mainstream Mathematics (Reveal)
Scheme of Work, Term 2, Academic Year 2022-2023

Purpose
- to define the **required** Mainstream Mathematics Student Learning Outcomes to be covered during the term for this grade
- to **recommend** the pace at which the Student Learning Outcomes are to be covered. The term's content is broken down into nine teaching weeks, allowing the coverage of topics within each week to be flexible.

Assessment
- Assessment details for Term 2 will be communicated separately.

Teachers should incorporate the Standards for Mathematical Practice (SMPs) in their instruction when and where appropriate.
The Standards for Mathematical Practice are:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Why are the Standards for Mathematical Practice important?
The Standards for Mathematical Practice set expectations for using mathematical language and representations to reason, solve problems, and model in preparation for careers and a wide range of college majors.

Week 1: Jan. 2 – 6, 2023

Module 5 – Functions

Lessons	Student Learning Outcomes	Common Core State Standards
M5L1 – Identify Functions	• Determine whether or not a relation is a function by identifying the number of outputs assigned to each input.	**8.F.1** Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
M5L2 – Function Tables	• Generate function tables from function rules and use the sets of ordered pairs to graph the functions.	
M5L3 – Construct Linear Functions	• Write linear functions from graphs, tables, and verbal descriptions by finding the rate of change and initial value.	**8.F.4** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

Week 2: Jan. 9 – 13, 2023		
Lessons	**Student Learning Outcomes**	**Common Core State Standards**
M5L4 – Compare Functions	• Compare functions that are represented in different ways using their initial values and rates of change.	**8.F.2** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
M5L5 – Nonlinear Functions	• Determine if a function, represented in different forms, is a linear or nonlinear function by using the rate of change, shape of the graph, or structure of the equation.	**8.F.3** Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.

Week 3: Jan. 16 – 20, 2023		
Lessons	**Student Learning Outcomes**	**Common Core State Standards**
M5L6 – Qualitative Graphs	• Recognize a qualitative graph and interpret the scenario it represents as well as create a qualitative graph.	**8.F.5** Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
Module 6 – Systems of Linear Equations		
M6L1 – Solve Systems of Equations by Graphing	• Write equations in slope-intercept form in order to graph them and use the graphs to solve a system of equations.	**8.EE.8** Analyze and solve pairs of simultaneous linear equations. **8.EE.8a** Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. **8.EE.8b** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. **8.EE.8c** Solve real-world and mathematical problems leading to two linear equations in two variables.

Week 4: Jan. 23 – 27, 2023		
Lessons	**Student Learning Outcomes**	**Common Core State Standards**
M6L2 – Determine Number of Solutions	• Use the slope-intercept form of lines in order to determine whether a system of equations has zero, one, or infinitely many solutions.	**8.EE.8** Analyze and solve pairs of simultaneous linear equations. **8.EE.8a** Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
M6L3 – Solve Systems of Equations by Substitution	• Use substitution to solve a system of linear equations, including those that have zero or infinitely many solutions.	**8.EE.8b** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. **8.EE.8c** Solve real-world and mathematical problems leading to two linear equations in two variables.

Week 5: Jan. 30 – Feb. 3, 2023

Lessons	Student Learning Outcomes	Common Core State Standards
M6L4 – Solve Systems of Equations by Elimination	• Use elimination to solve a system of linear equations.	**8.EE.8** Analyze and solve pairs of simultaneous linear equations. **8.EE.8a** Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
M6L5 – Write and Solve Systems of Equations	• Write and solve a system of equations that models a real-world scenario.	**8.EE.8b** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. **8.EE.8c** Solve real-world and mathematical problems leading to two linear equations in two variables.

Week 6: Feb. 6 – 10, 2023

Module 7 – Triangles and the Pythagorean Theorem

Lessons	Student Learning Outcomes	Common Core State Standards
M7L1 – Angle Relationships and Parallel Lines	• Use the relationships between angles formed by two parallel lines cut by a transversal to find the measures of missing angles.	**8.G.5** Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.
M7L2 – Angle Relationships and Triangles	• Find the measures of interior and exterior angles in a triangle by using relationships between these angles.	
M7L3 – The Pythagorean Theorem	• Find the measures of the sides of a right triangle using the Pythagorean Theorem and square roots.	**8.G.6** Explain a proof of the Pythagorean Theorem and its converse. **8.G.7** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. **8.EE.2** Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

Week 7: Feb. 13 – 17, 2023		
Lessons	**Student Learning Outcomes**	**Common Core State Standards**
M7L4 – Converse of the Pythagorean Theorem	• Determine if a triangle is a right triangle by using the converse of the Pythagorean Theorem.	**8.G.6** Explain a proof of the Pythagorean Theorem and its converse.
M7L5 – Distance on the Coordinate Plane	• Find the distance between two points on a coordinate plane using the Pythagorean Theorem.	**8.G.8** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Week 8: Feb. 20 – 24, 2023		
Module 8 – Transformations		
Lessons	**Student Learning Outcomes**	**Common Core State Standards**
M8L1 – Translations	• Translate figures on the coordinate plane and use coordinate notation to describe translations.	**8.G.1** Verify experimentally the properties of rotations, reflections, and translations. **8.G.1a** Lines are taken to lines, and line segments to line segments of the same length. **8.G.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
M8L2 – Reflections	• Describe reflections of figures on the coordinate plane using coordinates and coordinate notation.	
M8L3 – Rotations	• Use coordinate notation to find the coordinates of a figure that has been rotated about the origin, as well as describe the angle of rotation using the given graph and coordinates of the figures.	

Week 9: Feb. 27 – March 3, 2023		
Lessons	**Student Learning Outcomes**	**Common Core State Standards**
M8L4 – Dilations	• Describe dilations using coordinate notation as well as graph dilations on the coordinate plane using coordinate notation.	**8.G.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

Week 10: March 6 – 10, 2023 Week 11: March 13 – 17, 2023 Week 12: March 20 – 24, 2023
Term 2 Revision and End-of-Term Exam **Exam date to be determined by the Assessment Directorate**