

LESSON PLAN TEMPLATE

Lesson Title	Exploring Patterns in Sequences and the Cartesian Coordinate System
Learning Area/s	Mathematics
Name of Teacher/s	DEPED TAMBAYAN PH (Visit www.depedtambayanph.net for more downloads.)
Grade Level and Section	Grade 8
No. of Sessions	4 Sessions
References	None specified
Declaration of AI use	This lesson plan was co-created using Gemini AI to assist with unpacking competencies into a 4-session learning design, structuring activities, and assessment formulation.

Intentions.

Meaningful learning experiences are anchored in how we frame them. Start by deciding what you want learners to master by the end of the lesson – keep it clear and simple.

Learning Competency and Curriculum Standards:	Learning Competency: • Formulate the rule for finding the next term in a sequence by looking for patterns. • Illustrate and describe the Cartesian coordinate plane. Content Standards: The learners should have knowledge and understanding of... • measures of central tendency of ungrouped data • algebraic expressions and operations with monomials, binomials, and multinomials • special products for binomials, and factorization of polynomials • rational algebraic expressions and equations • rules for obtaining terms in sequences • plotting points, and finding distance and the midpoint of line segments on the Cartesian coordinate plane Performance Standards: By the end of the term, the learners are able to... • determine measures of central tendency of ungrouped data and use the measures to draw conclusions. • add and subtract monomials, and multiply combinations of monomials, binomials, and multinomials. • obtain special binomial products. • factorize different types of polynomials. • simplify, and operate with, rational algebraic expressions and solve simple rational algebraic equations. • obtain the rule for finding the next term in a sequence. • plot points, find the distance between two points, and find the midpoint of
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	line segments, on the Cartesian coordinate plane.			
	Session 1	Session 2	Session 3	Session 4
Learning Objectives:	- Identify patterns in numerical and visual sequences. - Determine the next terms in a sequence by observing recurring patterns. - Relate patterns to cultural designs and daily Filipino routines.	- Formulate a general rule for finding the nth term of a sequence. - Apply the formulated rule to find large-term values without manual counting. - Communicate the logic of a rule clearly in written form.	- Illustrate and describe the parts of the Cartesian coordinate plane (axes, origin, quadrants). - Differentiate between the x-coordinate and y-coordinate. - Explain the significance of the origin (0,0) in real-world mapping.	- Plot points accurately on the Cartesian coordinate plane using ordered pairs. - Identify the coordinates of a given point on a plane. - Relate coordinate plotting to local navigation and location tracking.
Learner Context:	Learners demonstrate a strong interest in visual arts and local craftsmanship, particularly in traditional weaving patterns like the 'Inabel' or 'Banig'. While most are proficient in basic arithmetic, some struggle with transitioning from concrete visual patterns to abstract numerical sequences. A significant number of learners are visual-spatial and respond well to manipulative-based activities.	Learners have shown competence in identifying 'what comes next' but find variables like 'n' or 'x' intimidating. They exhibit strength in collaborative environments where they can discuss their logic in 'Taglish' before finalizing in English. Possible barrier: low confidence in algebraic manipulation.	Learners are generally familiar with grid systems from playing local games like 'Battleship' or using mobile maps. However, they often confuse the horizontal and vertical directions. Their strength lies in visual mapping, while the barrier is technical vocabulary (abscissa, ordinate).	Learners show high engagement with competitive, game-like activities. Some still struggle with points involving zero (e.g., (0,5) vs (5,0)). The class has a mix of fast-finishers and those who require significant one-on-one guidance in manual plotting.

Learning Experience.

A learning experience is like a thoughtfully designed journey. Each activity and interaction builds towards meaningful understanding and growth. Identify activities and interactions to help learners gain knowledge, skills, or understanding in a purposeful way.

Pre-Lesson:	• Visual Warm-up: Display images of Filipino 'Banig' (mats) and 'Parol' (lantern) designs. • Guided Inquiry: Ask learners to identify repeating shapes or colors and predict what the next element in the design would be.	• Review: A quick game of 'Sequence Bingo' where the teacher describes a pattern and students mark the corresponding rule on their cards.	• Activity: 'Human Grid' – Mark the floor with masking tape to create a large coordinate system. Have students stand on different 'intersections'.	• Mental Math: Quickfire naming of quadrants based on signs (e.g., 'Positive-Negative!').
Flow:	• Scaffolding : Begin with physical objects (e.g., shells or stones) arranged in increasing patterns. Transition to drawing these patterns. • Active Retrieval: Recall basic operations. Ask: 'How did we get from the first	• Modeling: Demonstrate how a 'table of values' helps in seeing the relationship between the position (n) and the term value. • Scaffolding : Use the 'Jeepney Fare' example. Rule: Fare = Base + (n-1)increment	• Modeling: Draw a large Cartesian plane on the board. Label parts clearly using different colored chalk. • Active Retrieval: Ask students to point to 'North' (Positive Y) and 'East' (Positive X)	• Modeling: Demonstrate 'The Robot Move' – always walk along the x-axis first (left/right) before climbing/diving on the y-axis. • Scaffolding : Provide a 'Connect-the-Dots' Philippine-themed image (e.g., a

	number to the second?' • Social Learning: Group activity where students create their own 'Jeepney Route Pattern' based on fare increments (e.g., 13, 15, 17...). • Checks for Understanding: Use 'Thumb up/down' to verify if the class agrees on the next term in a sequence provided on the board.	ent. Show how this applies to any distance. • Social Learning: Pairs work together to 'crack the code' of mystery sequences provided in envelopes. • Checks for Understanding: 'Think-Pair-Share' on why a certain rule works for all terms, not just the first two.	relative to the origin. • Social Learning: Small groups create a 'Mini-Barangay' on a grid, deciding where the 'Church' or 'Market' should be located. • Checks for Understanding: Randomly call on students to identify which quadrant a specific part of their 'Mini-Barangay' is in.	Kubo or a Carabao) where the dots are identified by coordinates. • Social Learning: 'Coordinate Treasure Hunt' – Students work in pairs to find 'hidden treasures' by plotting coordinates given by the teacher. • Checks for Understanding: Peer-checking of coordinates during the treasure hunt activity.
Learning Resources:	• PowerPoint presentation on Filipino geometric designs. • Printed worksheets with sequence puzzles. • Whiteboard and markers.	• Algebra tiles or colored counters. • Worksheets for rule formulation. • Calculators for verifying large terms.	• Graphing boards or oversized grid paper. • Colored markers/chalk. • Philippine map with a grid overlay.	• Graph paper and rulers. • Projector for 'Coordinate Battleship' game. • Pre-printed 'Connect-the-Dots' coordinate sheets.
Opportunities for integration:	• Arts: Appreciation of indigenous weaving patterns.	• Social Studies: Population growth patterns in local	• Geography: Using latitude and longitude to locate provinces in	• Information Technology: Basic understanding of how pixels and

	● Economics : Understanding fare increases and savings patterns (Ipon challenge).	● Language: Translating word problems into algebraic expressions.	● Physical Education: Spatial awareness and movement within a defined boundary.	● Disaster Readiness: Plotting typhoon tracks using coordinates (Latitude/Longitude).
Assessment. Assessments reveal what learners have gained and what they still need help with. These are helpful in providing you with information to guide your future instruction throughout the entire session.				
Formative Assessment:	● Exit Ticket: Provide three different sequences (numerical and symbolic) and ask learners to provide the next two terms and a brief explanation of the 'logic' they used.	● Performance Task: 'The Pattern Architect' – Students are given a sequence and must write a formal 'Rule Card' that explains the pattern to a 'client' (classmate).	● Labeling Quiz: A blank Cartesian plane where students must correctly label the x-axis, y-axis, origin, and the four quadrants with their respective sign signs (+,+), (-,+), etc.	● Tangible Evidence: The completed 'Coordinate Art' project where students must list the coordinates they used to create a simple geometric figure.
Ways Forward. Meaningful learning can also happen beyond the classroom – for both the learners and the teacher. Pause and reflect on what happened today.				
Extended learning opportunitie	● Encourage learners to find one	● Provide a 'Challenge Problem'	● Assign learners to find a map	● 'Map My Room' – Challenge

s:	repeating pattern in their household (e.g., floor tiles, fence designs) and bring a sketch of it for the next session.	involving a decreasing sequence (e.g., battery life percentage over time) to prepare for negative increments.	of their town and see if it uses a grid system (A1, B2, etc.) and compare it to the Cartesian plane.	students to create a coordinate system for their bedroom and list the 'coordinates' of three objects.
Reflections:	- How many learners were able to generalize the pattern versus those who only solved for the next term? - Which specific visual aids most effectively bridged the gap to numerical sequences?	- Are the learners comfortable using 'n' as a placeholder for any number? - Did the use of local context (fares/savings) reduce the anxiety surrounding algebraic rules?	- Did the 'Human Grid' activity help tactile learners understand the concept of quadrants? - Are students still confusing the x-axis and y-axis?	- Which learners are still struggling with zero-value coordinates? - How did the 'Robot Move' analogy improve plotting accuracy compared to previous methods?