Grade 5

Unit	Unit Title	Lesson	Day
4.4	Patterns, Rules & Graphing Ordered Pairs	1	1 - 10

Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and the given rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*	•Generate two numerical patterns using two given rules.. •Given a "function" table generate the rule that is needed to find the unknown terms. •Identify relationships between corresponding terms. For example, the terms could be the number of teams and the number of players. Therefore, identify the relationship between the number of teams and the number of players. •Form ordered pairs consisting of corresponding terms from the two patterns in the table. *For example, (1.8) could represent 1 team, 8 players.* •Graph the relationship between two numerical patterns (ordered pair) on a coordinate grid *Note: the graph of the ordered pairs should form a straight (linear) line.*	**SMP2** Reason abstractly and quantitatively. **SMP7** Look for and make use of structure.	•How do you generate a numerical pattern if given a rule? •How can you identify a relationship between two numerical patterns? •Given a partially completed function table how do you determine that rule that will help you complete the table? •How do you write a set of ordered pairs using the function table? Points on a grid? •How do you graph the relationship between two numerical patterns? Show how this relationship provides you with ordered pairs? •What do you expect the graph of these ordered pairs to look like? Why?
5. Prerequisite Knowledge	**6. Essential Vocabulary**	**7. Possible Misconceptions**	**8. Necessary Materials**
•Graphing on a number line. •Recognizing patterns on hundreds charts, calendar, extending sequencing, etc. •Solve expressions and equations.	Pattern Rule Expression, equation *Function* table	Unable to identify the relationship. Writing rules.	**OnCore** Lessons 4 – 6 Student pgs 7 - 12 **Investigations**Unit 8 *Growth Patterns* Sessions 2.1 – 2.8 (as needed) **www.mathworksheetsland.com** Generating Math Patterns from Rules Math Patterns/Matching ***K-5Math Resources*** *Addition on the Coordinate Plane* *Subtraction on the Coordinate Plane* *Function Table & Coordinate Plane*

Instruction	
9. Instruction Practices (What are the teachers doing)	**10. Learning Practices (What are the students doing)**
Teachers will guide students to complete the pattern in a " function" table by generating the rule as well as complete a "function" table given a rule ((See the K-5 Math Resources). They will help students to write a rule by identifying the relationship between corresponding terms. *For example, to identify the relationship between the number of teams and the number of players.* Teachers will then show students how to form ordered pairs from the corresponding terms in the table. *For example, (1.8) would represent 1 team, 8 players on the team, (2,6) as 2 team, 16 players.* Recognizing the rule as for every team there are 8 players: 8 x #teams = total players or 8t=p. Writing rules is a very difficult concept for students to comprehend and most students will need to start with examples that are easy to visualize. Teachers will direct students on how to graph the relationship in the table using the ordered pairs. *Note: The graph of the ordered pairs should form a straight (linear) line.* Teachers will use the OnCore lessons 4 – 6, the K-5 Math Resources (which also include two pages of blank tables and graphs), the mathland worksheets and if time allows they may choose one or two of the lessons from Investigations Unit 8. These materials may be used in any order you prefer, the K-5 Addition and Subtraction on the Coordinate Plane and the mathland worksheets are example of materials that I believe match the wording in the standard; in these examples the students are given a rule then they generate the numerical patterns in a table. **NOTE:** Unit 5.5 Evaluating Expressions/Order of Operations only has 5 days allotted. If 10 days are not needed in this unit, feel free to start Unit 5.5 earlier ☺	Students will complete the pattern in a " function" table by generating the rule as well as complete a "function" table given a rule ((See the K-5 Math Resources). They will help write a rule by identifying the relationship between corresponding terms. *For example, to identify the relationship between the number of teams and the number of players.* Students will learn to form ordered pairs from the corresponding terms in the table. *For example, (1.8) would represent 1 team, 8 players on the team, (2,6) as 2 team, 16 players.* Writing rules is a very difficult concept for students to comprehend and most students will need to start with very easy examples. Students will then learn graph the relationship in the table using the ordered pairs. *Note: The graph of the ordered pairs should form a straight (linear) line.* Students will practice this standard using OnCore, Investigations, K-5 Math Resource Activities and mathland worksheets, depending on which materials the teacher chooses to utilize.