



Grade 4 Math Enrichment - Unit 2 - Patterns in our World

Unit Focus

Students explore patterns in our world. They look for visual patterns to represent numbers. Then, they explore for patterns in nature through visual images. Students study the Fibonacci sequence, fractals including Pascal's triangle, the hailstone conjecture and symmetry. Students are then challenged to create a pattern that can be displayed both visually and numerically for a fictional plant or animal.

Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
Common Core Mathematics: 4 - Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule Add 3 and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way. (CCSS.MATH.CONTENT.4.OA.C.5) - Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. (CCSS.MATH.CONTENT.4.G.A.3) - Construct viable arguments and critique the reasoning of others. (CCSS.MATH.MP.3) - Look for and express regularity in repeated reasoning. (CCSS.MATH.MP.8) Madison Public Schools Profile of a Graduate - Analyzing: Examining information/data/ evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. (POG.1.2) - Product Creation: Effectively use a medium to communicate important information. (POG.3.2)	<i>Students will be able to independently use their learning to...</i> T1 represent and interpret patterns in numbers, data and objects. T2 draw conclusions about graphs, shapes, equations, or objects.	
	Meaning	
	Understanding(s)	Essential Question(s)
	<i>Students will understand that...</i> U1 Mathematicians examine relationships to discern a pattern, generalizations, or structure. U2 Mathematicians can describe patterns, relations, and/or functions to access strategies to solve problems.	<i>Students will keep considering...</i> Q1 How do predictable patterns help us? Q2 How do you express and describe a pattern and use it to make predictions and solve a problem? Q3 How can change be described?
	Acquisition of Knowledge and Skill	
	Knowledge	Skill(s)
<i>Students will know...</i> K1 how to generate a number or shape pattern that follows a given rule K2 identify the radius of a circle K3 identify figures with lines of symmetry K4 identify lines of symmetry K5 Vocabulary: Fibonacci sequence, Fibonacci spiral, fractal, Pascal's triangle, line of symmetry, rotational symmetry, conjecture	<i>Students will be skilled at...</i> S1 how to identify features of a pattern that were not explicit in the rule used to generate that pattern S2 representing patterns both visually and numerically S3 explaining the features of a pattern	