Core Content

Cluster Title: Understand the concept of a function and use function notation.

Standard: F.IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then f(x) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation y = f(x).

Concepts and Skills to Master

- Understand the definition of a function.
- Identify functions, including functions represented in equations, tables, graphs, or context.
- Distinguish between domain and range.
- Write a relation in function notation.

Supports for Teachers

Critical Background Knowledge

- Tables
- Graphing

Academic Vocabulary

• Domain, range, function, input, output, corresponding, set, element,

Suggested Instructional Strategies	Resources
 Use tables, ordered pairs, mappings, graphs, function machines, and stories to explore the concept of a function and identify functions and non-functions and identify the domain and range of functions. 	 <u>http://www.shodor.org/</u> Vertical Line Test

Sample Formative Assessment Tasks	
Skill-based Task	Problem Task
Do the ordered pairs (-2,5), (9,8), (4, 2), (8,9), and (2,5)	Write a story that would generate a relation that is a function.
represent a function? Why or why not?	Write a story that would generate a relation that is not a function.

Core Content

Cluster Title: Understand the concept of a function and use function notation.

Standard: F.IF.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

Concepts and Skills to Master

- Write equations using function notation.
- Use function notation to evaluate functions for given inputs in the domain, including combinations and compositions of functions.
- Use function notation to express relationships between contextual variables.

Supports for Teachers

Critical Background Knowledge • Evaluate expressions • Familiarity with function notation **Academic Vocabulary** • Function notation, evaluate, input, domain, output, range **Suggested Instructional Strategies** Resources • Explore a variety of types of situations modeled by functions. Making it Happen (NCTM) Have students create contextual examples that can be modeled by linear or exponential functions. Sample Formative Assessment Tasks Skill-based Task Problem Task Given $f(x) = 3^x$, find f(4). Find a function from science, economics, or sports, write it in • function notation and explain its meaning at several points in the What does f(5)=7 mean? domain. Write an expression for the relationship depicted in the graph using function notation. 3 5 2 0 4 Time (s)

Core Content

Cluster Title: Understand the concept of a function and use function notation.

Standard: F.IF.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for $n \ge 1$.

Concepts and Skills to Master

- Recognize that sequences are functions.
- Define and express a recursive sequence as a function.
- Recognize that a sequence has a domain which is a subset of integers.
- Generate a sequence given a recursive function.

Supports for Teachers

Critical Background Knowledge

• Use function notation.

• Identify and describe patterns.

Academic Vocabulary

Recursive, sequence, functions, domain, subset			
Suggested Instructional Strategies	Resources		
 Draw connections to writing arithmetic and geometric sec recursively and with an explicit formula, use them to mod and translate between the two forms. Have students generate recursive sequences from conte- them in recursive notation. 	quences both www.illuminations.NCTM.org lel situations, • Counting the Trains		
Sample Formative Assessment Tasks			
Skill-based Task Write a recursive formula in function notation for the sequence generated by adding 3 to each successive term when beginning with 7.	Problem Task Draw the next arrangement of blocks in the sequence and describe the sequence using symbols.		