# High School Algebra Playlist: Defining Sequences as Functions

Aligns with CCSS.Math.Content.HSF.IF.A.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 ≥ 1*.

## Related Standards

- CCSS.Math.Content.HSF.IF.A.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*).

- CCSS.Math.Content.HSF.IF.A.2: Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

## Objectives

In this module, you will learn and practice the following skills:

- recognize that sequences can be defined using function notation
- apply a recursive function definition to find terms in a sequence

Let's get started!

## Key Terms

- A **function** is a relation which has each input related to exactly one output.
- **Function notation** describes a function using its name and the independent variables.
- A **sequence** is an ordered list of numbers.
- An **arithmetic sequence** has a constant difference between terms.
- A **geometric sequence** has a constant ratio between terms.

## Connections

- https://openstaxcollege.org/textbooks/algebra-and-trigonometry; section 13.1
- https://openstaxcollege.org/textbooks/algebra-and-trigonometry; section 3.1

# Defining Sequences as Functions

(CCSS.Math.Content.HSF.IF.A.3)

A **function** is a relation which has each input related to exactly one output. **Function notation** describes a function using its name and the independent variables. A **sequence** is an ordered list of numbers. An **arithmetic sequence** has a constant difference between terms. A **geometric sequence** has a constant ratio between terms.

If your students…

### Confuse arithmetic and geometric sequences:

Emphasize that the arithmetic sequence has a constant difference between terms, while the geometric sequence has a constant ratio.

WATCH: Represent a geometric sequence as an explicit rule

https://learnzillion.com/lesson_plans/6796-represent-a-geometric-sequence-as-an-explicit-rule

WATCH: Represent an arithmetic sequence as an explicit rule

https://learnzillion.com/lesson_plans/5556-represent-an-arithmetic-sequence-as-an-explicit-rule#fndtn-lesson

### Mishandle the first term:

Some students can determine how to "get" from one term in a sequence to the next, but they are not clear on what the initial term should be. The Fibonacci sequence provides a good example of needing to specify the "starting conditions".

WATCH: Exercise - Write a Fibonacci Function - Khan Academy

https://www.opened.com/video/exercise-write-a-fibonacci-function-khan-academy/39742