Sequences Defined

A sequence is a set of numbers written in a specific order.

$a_1, a_2, a_3, a_4, \ldots a_n, \ldots$

Each number in a sequence is called a **term**. A term is identified in two ways:

1. By its position in the sequence – 1st term, 2nd term, 3rd term, etc.
2. By its value – the 1st term is… , the 2nd term is… , the 3rd term is…

In the example above, the subscript indicates the term number.

Each number in a sequence is obtained from a function.

$a_n=f(n)$

A sequence is **recursive** if the function depends on previous terms in the sequence.

To find the value of a specific term, plug the term number into the sequence function.

Partial Sums of a Sequence

A partial sum means you add together the first specified number of terms in the sequence:

S_1 – add the first one term
S_2 – add the first two terms
S_3 – add the first three terms

Sigma Notation

Anyone familiar with computer programming will recognize this as a loop.

Let's say you want to calculate the 5th partial sum of a sequence. Starting with 1, you calculate the value of each term up through 5: 1st, 2nd, 3rd, 4th, 5th. Then you add them together.

You start at 1. You end at 5.
You need a variable to keep track of which term you are on. Let's use k. This is called the index of summation, or the summation variable.

The Greek capital letter sigma, Σ, is used to indicate summation.
Below the Σ, you set your starting point: k=1.
Above the Σ, you set your ending point: 5.

$$\sum_{k=1}^{5} f(k)$$

Writing Sums in Sigma Notation

The trick is figuring out the function.

Keep in mind that each term uses the term number.

Ask yourself: What is being done to the term number to get the term value?

It is helpful to write the term number above the term value:

Term Number:	1st	2nd	3rd	4th	5th	6th	7th
Term Value:	1^2	2^2	3^2	4^2	5^2	6^2	7^2