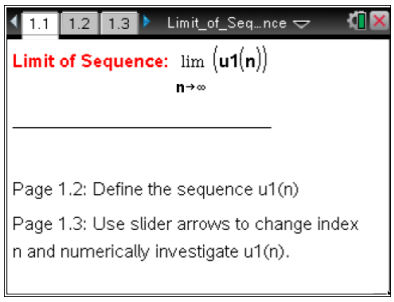
About the Mathematics

The *Limit_of_Sequence.tns* document provides a simple but powerful tool for investigating limits of functions numerically. The idea is to consider $\lim_{n\to\infty}(u1(n))$ by substituting a sequence of positive integer values for *n* that get larger and larger.



Math Objectives

- Students will have the opportunity to perform numerical investigations of the limits of sequences.
- Students will look for and make use of structure. (CCSS Mathematical Practice)
- Students will reason abstractly and quantitatively. (CCSS Mathematical Practice)
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TI-Nspire™ Technology Skills:

- Download a TI-Nspire document
- Open a document
- Move between pages
- Click on a minimized slider
- Define a sequence on a Calculator page

Tech Tip:

- Make sure the font size on your TI-Nspire handheld is set to Medium.

Lesson Materials:
Limit_of_Sequence.tns

Using the Document

Define **u**1(n) on page 1.2 to set the function to be investigated. (The example provided is for **u**1(n) = $\frac{1}{n}$.) On page 1.3, the limit under investigation is displayed. The slider arrows have been set up to allow the user to step through a sequence of positive integer values for *n*. The sequence on index values starts at 1. The sequences begin marching in 1-unit steps, then 10-unit steps, and finally switch to "geometric" steps (of factor 10). To consider a new function, define a new sequence **u**1(n).

Possible Application

Typically, you will want students to investigate a variety of sequence behaviors. You can combine the numerical investigation with a look at the graph of the sequence and then repeatedly zoom out horizontally. (The results of the numerical investigation can also be compared to the CAS result of evaluating the limit, if TI-Nspire CAS is used.)