Math Objectives

• Students will evaluate the limit of a sequence graphically.

Activity Types

• Student Exploration
• Group Activity

About the Lesson

• Students will fill in spreadsheet for values of a sequence. Using the spreadsheet, students will create a scatter plot of the sequence and determine if the sequence converges or diverges.

Directions

• Detailed directions for the first example of this activity are provided on the student worksheet. Additional problems can be completed by repeating the same steps.
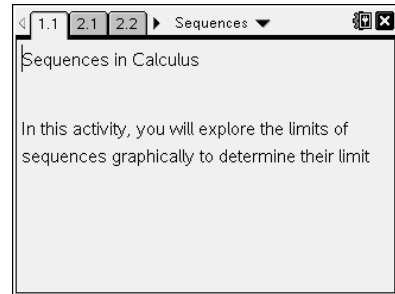
TI-Nspire™ Technology Skills:

• Download a TI-Nspire document
• Open a document
• Move between pages
• Enter a formula in a spreadsheet
• Set up a scatter plot

Tech Tips:

• Make sure the font size on your TI-Nspire handheld is set to Medium.
• You can hide the function entry line by pressing (ctrl) [G].

Lesson Materials:
Student Activity
Sequences_Student.pdf
Sequences_Student.doc

TI-Nspire document
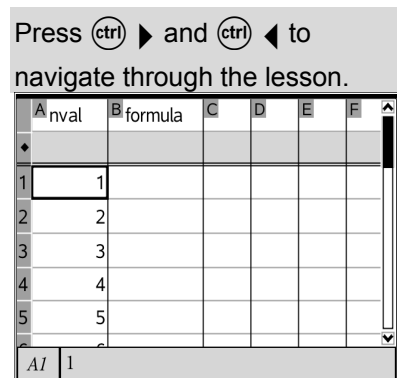Sequences.tns

Visit www.mathnspired.com for lesson updates.

Student Activity Questions and Answers

PART I

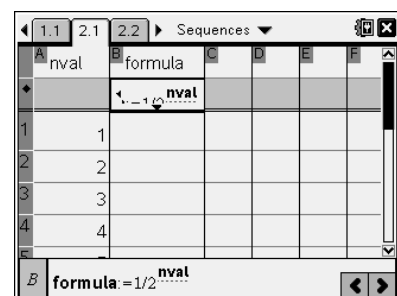Teacher led example: Find the limit of $a_n = \dfrac{1}{2^n}$.

Move to page 2.1.

Step 1: This first page is a spreadsheet with the values 1 to 10
filled in for the term index values of a sequence.

**Step 2:** Type the formula for the sequence in the box under the
formula column.

   Note: nval is the variable used for the values in column A.
   Use **nval** to represent the *n* value in the sequence.

Step 3: Press (enter) to fill in the formula column.

Step 4: Move to page **2.2** to graph the sequence.

   Note: To graph the sequence, select **Menu > Graph Type
   > Scatter Plot.** Next, press the (var) key and select **nval.**
   Next, tab to the *y* box, press the (var) key, and select
   formula. The sequence will be graphed.
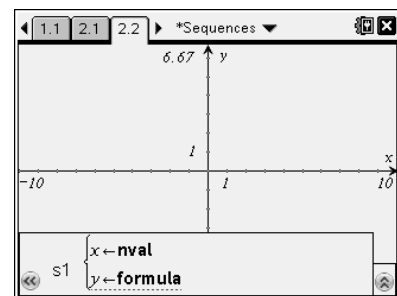
Step 5: Use (ctrl) ▶ to move to page 2.3 to write your answer for this
question.

   Note: Students can record answers in the TI-Nspire
   document or on the student worksheet. You decide.

Press (ctrl) ▶ and (ctrl) ◀ to
navigate through the lesson.
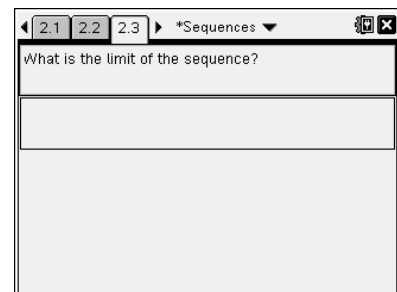
PART II

Students will find the limit of the following sequences graphically using their TI-Nspire handheld or software.

Note: The TI-Nspire document is set up for students to work on each question below in a different problem. You decide if you want your students to record their answers in the TI-Nspire document or on the student worksheet.

1. $a_n = \dfrac{2}{1 - n^3}$

    Answer: 0

2. $a_n = \left(1 + \dfrac{1}{n}\right)^n$

    Answer: e

3. $a_n = 1 - \dfrac{1}{n}$

    Answer: 1

4. $a_n = \dfrac{2 - 3n}{2 + 3n}$

    Answer: -1

5. $a_n = (-1)^n$

    Answer: no limit