

## Activity 5

### More Skip Counting— $\frac{2}{8}, \frac{4}{8}, \frac{6}{8}, \frac{8}{8}$ , Who Do We Appreciate This Time?



### Teacher Notes

#### Objective

- ◆ To explore skip counting to complete patterns with fractions.
- ◆ To develop addition of fractions.

#### Materials

- ◆ TI-73 Calculator

#### Introduction

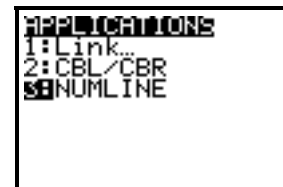
We can use the idea of skip counting to enhance students' understanding of addition and pattern completion. This activity will show how you might foster those skills.

This activity provides students the opportunity to construct patterns using the Number Line application.

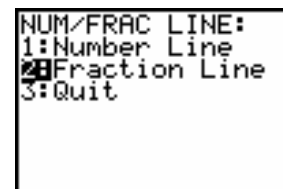
#### Procedure

1. Demonstrate how to create the pattern  $\frac{2}{8}, \frac{4}{8}, \frac{6}{8}, \frac{8}{8}, \frac{10}{8}, \frac{12}{8}, \dots$  using the Number Line application.

Start the Number Line application by pressing **[APPS]** and pressing **▾** to select the NUMLINE application.



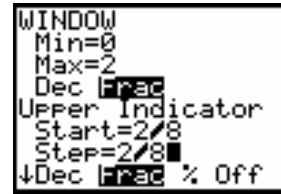
Once the App has started, select 2: Fraction Line.



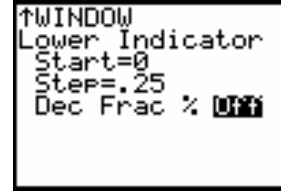
Press **[MODE]** to change the Mode setting to match the settings shown at the right.



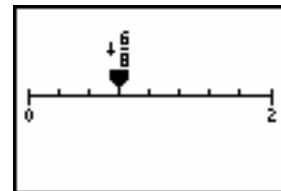
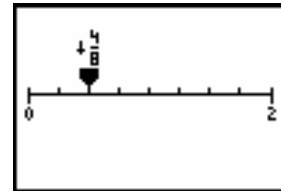
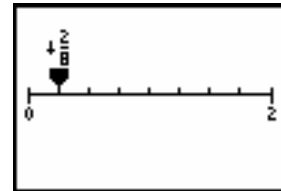
To view the pattern, change the window values to match those seen at the right. Choose **Frac**, and under Upper Indicator, change **Start** to  $\frac{2}{8}$ , **Step** to  $\frac{2}{8}$ . (To enter  $\frac{2}{8}$ , press 2  $\frac{\square}{\square}$  8.)



Press  $\square$  to view the window for the Lower Indicator. Select **Off** for the Lower Indicator.

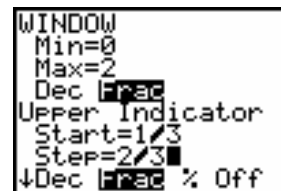


Press  $\square$  to see the Number Line. Now, press  $\square$  a few times to see the next terms in the sequence. You should see the indicator move from  $\frac{2}{8}$  to  $\frac{4}{8}$  then to  $\frac{6}{8}, \frac{8}{8}, \frac{10}{8}$  finally  $\frac{12}{8}$ . The value of each step is  $\frac{2}{8}$ , matching the value entered into the window settings. The arrows in front of these fractions indicate that the fraction is not simplified.

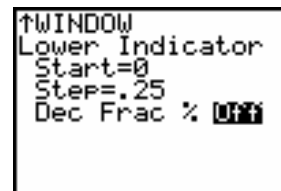


- Distribute the Student Activity pages with the problem statement. Have students work in pairs.
- Have students access the Number Line application by pressing  $\square$  and pressing  $\square$  to select the NUMLINE application. Press  $\square$  twice to get to the NUM/FRAC line menu and select 2: Fraction Line.

In order for students to view the pattern change they must change the calculators' window values to match those seen at the right. Change **Min** to 0, **Max** to 4, and under Upper Indicator set **Start** to  $\frac{1}{3}$ , **Step** to  $\frac{2}{3}$ , and select **Frac**.



Press  $\square$  to view the window for the Lower Indicator. Select **Off** for the Lower Indicator.



The indicator will start at  $\frac{1}{3}$ , and will jump by  $\frac{2}{3}$  each time  $\square$  is pressed. Eventually the value will exceed 4, but the window will automatically adjust to show the correct location for the indicator.

4. Students will first do the pattern completion activity with improper fractions and then with mixed numbers.
6. Students will see that changing an improper fraction to a mixed number is *not* the same as simplifying the fraction.
8. Students might notice that it is easier to determine the common difference between terms when working with improper fractions.

### Answer Key

4.  $\frac{1}{3}, \frac{3}{3}, \frac{5}{3}, \frac{7}{3}, \frac{9}{3}, \frac{11}{3}, \frac{13}{3}, \frac{15}{3}, \frac{17}{3}, \frac{19}{3}$

5. a.  $\frac{3}{7}, \frac{6}{7}, \frac{9}{7}, \frac{12}{7}, \frac{15}{7}, \frac{18}{7}, \frac{21}{7}, \frac{24}{7}, \frac{27}{7}, \frac{30}{7}$

Start =  $\frac{3}{7}$ , Step =  $\frac{3}{7}$

b.  $\frac{6}{11}, \frac{12}{11}, \frac{18}{11}, \frac{24}{11}, \frac{30}{11}, \frac{36}{11}, \frac{42}{11}, \frac{48}{11}, \frac{54}{11}, \frac{60}{11}$

Start =  $\frac{6}{11}$ , Step =  $\frac{6}{11}$

c.  $\frac{7}{3}, \frac{14}{3}, \frac{21}{3}, \frac{28}{3}, \frac{35}{3}, \frac{42}{3}, \frac{49}{3}, \frac{56}{3}, \frac{63}{3}, \frac{70}{3}$

Start =  $\frac{7}{3}$ , Step =  $\frac{7}{3}$

d.  $\frac{9}{12}, \frac{18}{12}, \frac{27}{12}, \frac{36}{12}, \frac{45}{12}, \frac{54}{12}, \frac{63}{12}, \frac{72}{12}, \frac{81}{12}, \frac{90}{12}$

Start =  $\frac{9}{12}$ , Step =  $\frac{9}{12}$

e.  $\frac{0}{8}, \frac{10}{8}, \frac{20}{8}, \frac{30}{8}, \frac{40}{8}, \frac{50}{8}, \frac{60}{8}, \frac{70}{8}, \frac{80}{8}, \frac{90}{8}$

Start =  $\frac{0}{8}$ , Step =  $\frac{10}{8}$

f.  $\frac{0}{9}, \frac{13}{9}, \frac{26}{9}, \frac{39}{9}, \frac{52}{9}, \frac{65}{9}, \frac{78}{9}, \frac{91}{9}, \frac{104}{9}, \frac{117}{9}$

Start =  $\frac{0}{9}$ , Step =  $\frac{13}{9}$

7.  $\frac{1}{5}, 1\frac{2}{5}, 2\frac{3}{5}, 3\frac{4}{5}, 5, 6\frac{1}{5}, 7\frac{2}{5}, 8\frac{3}{5}, 9\frac{4}{5}, 11$

Start =  $\frac{1}{5}$ , Step =  $1\frac{1}{5}$

8. a.  $\frac{3}{7}, \frac{6}{7}, 1\frac{2}{7}, 1\frac{5}{7}, 2\frac{1}{7}, 2\frac{4}{7}, 3\frac{3}{7}, 3\frac{6}{7}, 4\frac{1}{7}, 4\frac{4}{7}$

Start =  $\frac{3}{7}$  Step =  $\frac{3}{7}$

b.  $\frac{6}{11}, 1\frac{1}{11}, 1\frac{7}{11}, 2\frac{2}{11}, 2\frac{8}{11}, 3\frac{3}{11}, 3\frac{9}{11}, 4\frac{4}{11}, 4\frac{10}{11}, 5\frac{5}{11}$

Start =  $\frac{6}{11}$  Step =  $\frac{6}{11}$

c.  $2\frac{1}{3}, 4\frac{2}{3}, 7, 9\frac{1}{3}, 11\frac{2}{3}, 14, 16\frac{1}{3}, 18\frac{2}{3}, 21, 23\frac{1}{3}$

Start =  $2\frac{1}{3}$  Step =  $2\frac{1}{3}$

d.  $\frac{9}{12}, 1\frac{6}{12}, 2\frac{3}{12}, 3, 3\frac{9}{12}, 4\frac{6}{12}, 5\frac{3}{12}, 6, 6\frac{9}{12}, 7\frac{6}{12}$

Start =  $\frac{9}{12}$  Step =  $\frac{9}{12}$

e.  $\frac{0}{8}, 1\frac{2}{8}, 2\frac{4}{8}, 2\frac{6}{8}, 3, 3\frac{2}{8}, 3\frac{4}{8}, 3\frac{6}{8}, 4, 4\frac{2}{8}$

Start =  $\frac{0}{8}$  Step =  $1\frac{2}{8}$

f.  $2\frac{8}{9}, 4\frac{3}{9}, 5\frac{7}{9}, 7\frac{2}{9}, 8\frac{6}{9}, 10\frac{1}{9}, 11\frac{5}{9}, 13, 14\frac{4}{9}, 15\frac{8}{9}$

Start =  $2\frac{8}{9}$  Step =  $1\frac{4}{9}$

9.  $6, 5\frac{2}{5}, 4\frac{4}{5}, 4\frac{1}{5}, 3\frac{3}{5}, 3, 2\frac{2}{5}, 1\frac{4}{5}, 1\frac{1}{5}, \frac{3}{5}$

Start = 10 Step =  $-\frac{3}{5}$

- 10.** Please be sure to have your students share these with classmates.  
Answers will vary.



Name \_\_\_\_\_

Date \_\_\_\_\_

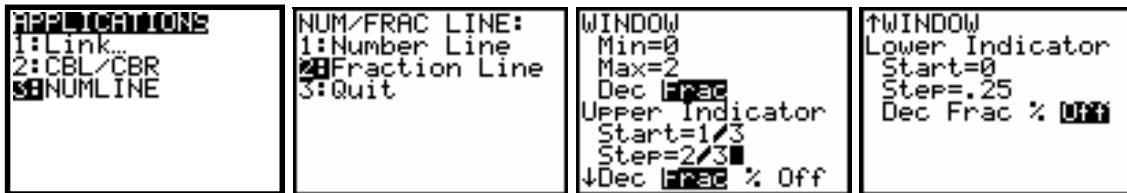
## Activity 5

# More Skip Counting— $\frac{2}{8}, \frac{4}{8}, \frac{6}{8}, \frac{8}{8}$ , Who Do We Appreciate

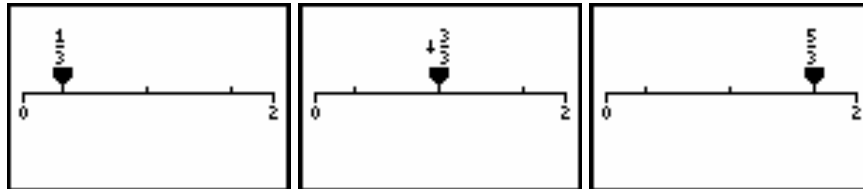
## This Time?

**Objective:** In this activity, you will investigate how to complete patterns using the fraction Number Line. You will be using the Number Line application on the TI-73 calculator.

1. Access the Number Line application by pressing **[APPS]** and pressing **[↓]** to select the NUMLINE application. Press **[ENTER]** twice to get to the NUM/FRAC LINE menu and select 2: Fraction Line.



2. In order to view the pattern change you must change the calculator's window values to match those seen above. Press **[WINDOW]** and change **Min** to 0, **Max** to 4, **Start** to  $\frac{1}{3}$ , **Step** to  $\frac{2}{3}$ , and select **Frac**. Press **[↓]** to view the window for the Lower Indicator and select **Off** for the Lower Indicator.
3. Press **[GRAPH]** and then press **[▶]**. Notice that every time **[▶]** is pressed, the indicator increases by  $\frac{2}{3}$ . Eventually the value will exceed 4, but the window will automatically adjust to show the correct location for the indicator.



4. Complete the next seven values:  $\frac{1}{3}, \frac{3}{3}, \frac{5}{3}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$

5. Use the Number Line application to complete these patterns.

a.  $\frac{3}{7}, \frac{6}{7}, \frac{9}{7}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start = \_\_\_ Step = \_\_\_

b.  $\frac{6}{11}, \frac{12}{11}, \frac{18}{11}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start = \_\_\_ Step = \_\_\_

c.  $\frac{7}{3}, \frac{14}{3}, \frac{21}{3}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start = \_\_\_ Step = \_\_\_

d.  $\frac{9}{12}, \frac{18}{12}, \frac{27}{12}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start = \_\_\_ Step = \_\_\_

e.  $\frac{0}{8}, \frac{10}{8}, \frac{20}{8}, \frac{30}{8}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start = \_\_\_ Step = \_\_\_

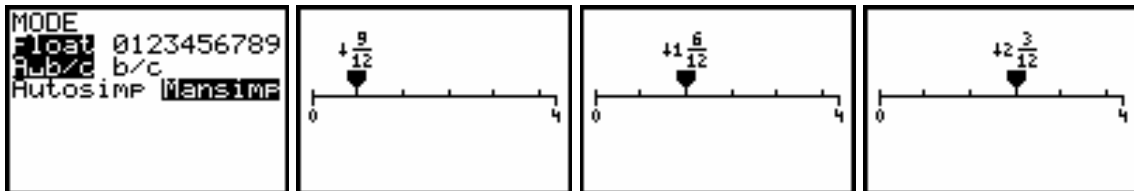
f.  $\frac{0}{9}, \frac{13}{9}, \frac{26}{9}, \frac{39}{9}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start = \_\_\_ Step = \_\_\_

6. Some patterns are not written as fractions only. Sometimes the patterns include mixed and whole numbers. For instance, the sequence

$\frac{9}{12}, \frac{18}{12}, \frac{27}{12}, \dots$  could also be written as:

$\frac{9}{12}, 1\frac{6}{12}, 2\frac{3}{12}, \dots$

To view mixed numbers, press **[MODE]** and change to the mixed number display. **Mansimp** means that the fractions are not simplified automatically.



7. Find the other values for this sequence:

$\frac{1}{5}, 1\frac{2}{5}, 2\frac{3}{5}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start = \_\_\_ Step = \_\_\_

8. Use the Number Line application to complete these patterns.

a.  $\frac{3}{7}, \frac{6}{7}, \frac{9}{7}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start = \_\_\_ Step = \_\_\_

b.  $\frac{6}{11}, 1\frac{1}{11}, 1\frac{7}{11}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start = \_\_\_ Step = \_\_\_

c.  $2\frac{1}{3}, 4\frac{2}{3}, 7, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start = \_\_\_ Step = \_\_\_

d.  $\frac{9}{12}, 1\frac{6}{12}, 2\frac{3}{12}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start = \_\_\_ Step = \_\_\_

e.  $\frac{0}{8}, 1\frac{2}{8}, 2\frac{4}{8}, 3\frac{6}{8}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start =  $\underline{\quad}$  Step =  $\underline{\quad}$

f.  $1\frac{4}{9}, 2\frac{8}{9}, 4\frac{3}{9}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start =  $\underline{\quad}$  Step =  $\underline{\quad}$

9. Create a number pattern starting at 6. Subtract  $\frac{3}{5}$  to get the next value, then subtract  $\frac{3}{5}$  again to get the next value in the sequence. Complete the pattern.

6,  $5\frac{2}{5}, 4\frac{4}{5}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start =  $\underline{\quad}$  Step =  $\underline{\quad}$

How many times can you take away  $\frac{3}{5}$  before you reach 0?

10. Create a number pattern like those above. Explain how the pattern was created. Be prepared to share it with your classmates.

$\underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}$  Start =  $\underline{\quad}$  Step =  $\underline{\quad}$