

Teacher Notes

Grade level 5-8

Subject: Math

Time required: 60 minutes

TI-73 Explorer™ Activity: Comparing Fractions—Which is Greater

By: Deborah Van Overbeke

Activity Overview:

There will be times when students need to decide if one fraction is greater than another fraction. For example, students may need to decide if they want to eat $\frac{2}{3}$ or $\frac{3}{4}$ of a pizza. Of course, their decision will depend upon how hungry they are. Therefore, students will need to have strategies to assist in deciding which fraction is larger. In this activity, students, in partners, will decide the greater of two fractions, decide on a reason that one is greater than the other, and check their answers using the Number Line application.

Concepts:

- To develop fraction number sense.
- To compare positive rational numbers using alternative strategies to drawing, modeling, or applying rules.

Teacher Preparation:

- Check that students have the prior knowledge of the meaning of fractions, including a clear understanding of numerators and denominators.
- Download the NUMLINE application on the TI-73 calculators.
- Download a copy of the student handout for each pair of students.
- Prepare for an excellent discussion and development of conceptual understanding of fractions during the whole group discussion on which fraction is greater.

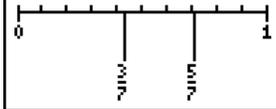
Procedure:

1. Create pairs of students. Instruct students to complete *Table 1*. They need to underline the fraction which is greater than the other. Without using drawings, models, or any rules, they need to write one or more reasons for their choice. Their reason/s should rely on what they know about fractions including numerators and denominators. If needed, review the meaning of fractions including what the numerator and denominator represent in a fraction.

Table 1

Fractions Underline the greater fraction.	Reason/s
$\frac{5}{7}$ or $\frac{3}{7}$	
$\frac{4}{5}$ or $\frac{4}{8}$	
$\frac{2}{6}$ or $\frac{4}{7}$	
$\frac{3}{5}$ or $\frac{5}{9}$	

When students have committed to answers, demonstrate how to access the Number Line on the TI-73 calculator. Then provide step-by-step directions for numbers 2 - 3. They can complete directions listed in number 4 with *Table 2* in pairs.

2. Access the Number Line application by pressing [APPS] .	
2.a. Press [\blacktriangledown] to select the NUMLINE application	<pre>APPLICATIONS 1:Link... 2:AreaForm 3:CBL/CBR 4:GEOBOARD 5:MathHand 6:NUMLINE 7:SMILEMth</pre>
2.b. Press ENTER twice to get to the NUM/FRAC LINE menu and select 2: Fraction Line.	<pre>NUM/FRAC LINE: 1: Number Line 2: Fraction Line 3: Quit</pre>
2.c. Press [WINDOW] and set Min = 0, Max = 1, Start = 0, Step = .1 . Choose Frac .	<pre>WINDOW Min=0 Max=1 Dec [Frac] Upper Indicator Start=0 Step=.1 ↓Dec [] % Off</pre>
2.d. Turn off the lower indicator.	<pre>↑WINDOW Lower Indicator Start=0 Step=.25 Dec Frac % []</pre>
2.e. Press [DRAW]	
2.f. Press [ENTER] to select DrawLabel .	<pre>DRAW [] DrawLabel 2:ClrDraw</pre>
2.g. Enter 5 [b/c] 7 and [ENTER] . The number line will show $5/7$. Then enter 3 [b/c] 7 and [ENTER] . The number line will also show $3/7$. You will see that $3/7$ is to the left of $5/7$; therefore, $5/7$ is greater than $3/7$ as the largest of the two numbers is to the right of the smaller number. In <i>Table 2</i> below, underline Yes if the answer you gave in <i>Table 1</i> was correct or No if your answer was incorrect. If you underlined No , then underline the greater fraction and write a reason for this choice.	<pre>Label=</pre> 

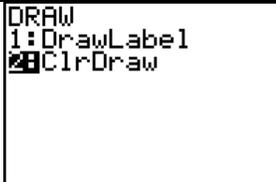
3. To clear the marks on the number line, press DRAW and select ClrDraw to clear the drawing.	
4. Repeat steps 2.e. through 3, to check your answers for the remaining questions.	

Table 2

Right Answer Underline Yes or No.	Fractions Underline the greater fraction.	New Reason (if first answer not correct).
Yes or No	<u>5/7</u> or 3/7	
Yes or No	4/5 or <u>4/8</u>	
Yes or No	2/6 or <u>4/7</u>	
Yes or No	3/5 or 5/9	

5. When students have completed *Table 2*, have each pair of students share which fraction, $4/5$ or $4/8$, is greater and why. Record each pair's answer on poster board. Then discuss the answers. Possible reasons are listed in the section below. However, it is important that students share their reasons instead of just teaching the strategies listed in the Reason/s column. Continue with the discussion using $2/6$ or $4/7$ and $3/5$ or $5/9$.

Teacher Notes on Comparisons

Fractions Underline the greater fraction.	Reason/s
<u>5/7</u> or 3/7	<i>More of the same-size parts.</i> The denominator indicates that each fraction is divided into 7 equal-sized parts. In $5/7$, there are 5 of the 7 parts. In $3/7$, there are 3 of the 7 parts. If one has 5 of the 7 parts, it represents a larger portion than 3 of the 7 parts.
<u>4/5</u> or 4/8	<i>Same number of parts but parts of different sizes.</i> If a whole is divided into 5 parts, each part would be larger than if a whole is divided into 8 parts. Therefore, if one has $4/5$ as compared to $4/8$, $4/5$ is larger because 4 parts of a whole divided into 5 parts is greater than 4 parts of a whole divided into 8 parts.
2/6 or <u>4/7</u>	<i>More and less than one-half.</i> In this pair, $2/6$ is less than half ($3/6$) while $4/7$ is greater than half ($3.5/7$); therefore, $4/7$ is the greater fraction.
<u>3/5</u> or 5/9	<i>Distance from one-half or one whole.</i> In this pair, $3/5$ is greater as it is $1/5$ more than a half while $5/9$ is just $1/9$ more than a half.

6. Homework: Students can complete the following assignment to check for understanding.

Fractions Underline the greater fraction.	Reason/s
$5/8$ or <u>$4/6$</u>	<i>Distance from one-half or one whole.</i>
<u>$5/7$</u> or $5/9$	<i>Same number of parts but parts of different sizes.</i>
<u>$3/4$</u> or $3/7$	<i>More and less than one-half.</i>
<u>$4/5$</u> or $3/5$	<i>More of the same-size parts.</i>

Notes:

The lesson idea was developed from information provided in the following text:

Van De Walle, J. A. (2006). *Elementary and middle school mathematics: Teaching developmentally*. Boston: Pearson.

Wording for the TI-73 directions was modeled after wording in the following text:

Texas Instruments. (1999). Comparing decimals—Wider isn't always larger! In Texas Instruments, *Explorations*, pp. 81-85.