

---

## Different Looks, Same Values

ID: 11731

Time required  
*45 minutes*

---

### Activity Overview

*In this activity, students explore the meaning and purpose of equivalent fractions. They also practice writing fractions that meet a given criteria.*

### Topic: Numbers and Operations

- *Compute fluently and make reasonable estimates*
  - *Select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods*
- 

### Teacher Preparation and Notes

- *TI-Navigator is not required for this activity, but an extension is given for those teachers that would like to use it.*
- ***To download the student worksheet and TI-Navigator™ files, go to [education.ti.com/exchange](http://education.ti.com/exchange) and enter “11731” in the quick search box.***

### Associated Materials

- *MGAct03\_SameValues\_worksheet\_TI73.doc*
- *MGAct03\_Nav\_TI73.act*

### Suggested Related Activities

*To download the activity listed, go to [education.ti.com/exchange](http://education.ti.com/exchange) and enter the number in the quick search box.*

- *Fraction Decimal Challenge (TI-73 Explorer) — 6681*
- *Rational Match (TI-73 Explorer) — 5215*
- *Rational Number Rampage App (TI-73 Explorer) — 6892*
- *Visual Fractions (TI-73 Explorer) — 6669*

**Problem 1 – The Same Name Game**

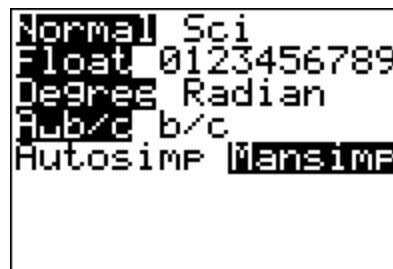
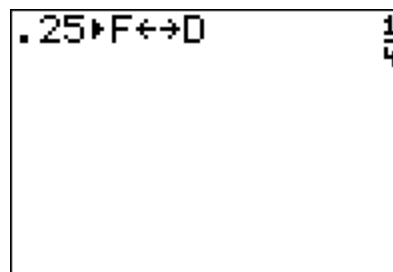
Students first explore finding equivalent fractions to a given decimal.

Questions 1-4

You may want to give students an opportunity to discuss with a partner a strategy for finding equivalent fractions.

Students can convert the given decimal to a fraction using the  $\boxed{F \leftrightarrow D}$  button. If the calculator **Mode** is set to **Mansimp** (Manually Simplify) then the calculator will not reduce the fraction. A small arrow will appear next to the result if it can still be simplified.

Students may determine that they can multiply a fraction by an integer to obtain a new fraction, if the calculator is *not* in **Autosimp** mode.



*Discussion Questions:*

- How could all these numbers represent the same value?
- Tell a story that would require one number, such as  $\frac{3}{12}$  rather than another, such as  $\frac{1}{4}$ . (e.g. I dropped a dozen eggs and broke 3 of them; I have 4 people in my family and 1 of them is a boy.)
- How many equivalent fractions can you write for a given number?
- What method do you use to find an equivalent fraction?

Questions 6-7

Students can use the  $\boxed{SIMP}$  command, if needed, to simplify each fraction to see which are equivalent.

The key presses for the problem to the right are  $\boxed{8}$   $\boxed{b/c}$   $\boxed{1}$   $\boxed{2}$   $\boxed{ENTER}$ . If the Mode is set to **Mansimp**, students will need to press  $\boxed{SIMP}$  before pressing  $\boxed{ENTER}$ .



**Problem 2 – Greater Than or Less Than**

Questions 8-13

Again, multiplication and/or simplification can be used to help students find fractions that meet the given criteria. Students may want to pick a fraction and then test it to see if it fits the given criteria. They may find it easier to pick a decimal between the given decimals and then convert it to a fraction.

### Problem 3 – Visually Find Equivalent Fractions

#### Questions 14-16

Students should find ways to divide the rectangle into other equivalent “sections”. If there are 12 sections, help them see that there are also 4 smaller sections that are equivalent sizes.

#### Extension – TI-Navigator

- Once students have an equivalent fraction on their screen, use **Screen Capture** to display the result. See if all students have the same equivalent fraction or if the answers vary.  
Have students discuss if all the answers are correct.
- If students need additional help understanding equivalent fractions, load the activity settings file *MGWeek13\_Nav01\_T173.act*. This sets up Activity Center so students can fill in a rectangle that is divided up into 12 sections.

Start the activity and instruct students to fill in  $\frac{4}{12}$  of the rectangle and send their results into Activity Center.

From the diagram, students should see that other fractions can also be used to represent the same region. Launch **Quick Poll** (with Open Response) and ask students to type in an equivalent fraction using the  $\frac{\square}{\square}$  key.

Repeat this activity for other fractions such as  $\frac{3}{12}$  or  $\frac{7}{12}$ . Students should recognize that some fractions can be reduced while others are already in simplest form.

You can also modify this activity by clicking **Configure** and changing the dimensions of the rectangle accordingly. Make sure you clear the activity data before starting the next activity.

- Call out a fraction. Challenge students to come up with an equivalent fraction they think no one else will come up with. When everyone is ready, use **Screen Capture** to collect their expressions.

All students that have another student with an equivalent fraction are eliminated from the next round. See how creative students get with naming equivalent fractions. After several rounds, have students discuss how they were finding equivalent fractions and how they were finding the unique fractions.

**Solutions – Student Worksheet**
Problem 1

1-4. Answers will vary. Students should find fractions that are equivalent to the given fraction.

5. Answers will vary. Stories should reflect the reason to have different equivalent fractions, making it easier to communicate the portion of the whole.

6. Group 1:  $\frac{1}{2}, \frac{8}{16}, \frac{10}{20}$

Group 2:  $\frac{2}{3}, \frac{8}{12}, \frac{10}{15}, \frac{30}{45}, \frac{4}{6}$

Group 3:  $\frac{4}{9}, \frac{12}{27}, \frac{20}{45}$

7. Group 1:  $\frac{1}{3}, \frac{6}{18}, \frac{5}{15}, \frac{2}{6}$

Group 2:  $\frac{2}{7}, \frac{6}{21}, \frac{4}{14}$

Group 3:  $\frac{3}{5}, \frac{6}{10}, \frac{12}{20}, \frac{15}{25}$

Problem 2

8-13. Answers will vary. Any given answers should meet the given criteria.

Problem 3

14.  $\frac{4}{12}$  and  $\frac{15}{25}$

15.  $\frac{10}{20}$  and  $\frac{1}{2}$  and  $\frac{2}{4}$

16.  $\frac{8}{40}$  and  $\frac{1}{5}$  and  $\frac{4}{20}$



**Problem 1 – The Same Name Game**

Find four fractions that are equivalent to the given decimal.

1. 0.25

\_\_\_\_\_  
\_\_\_\_\_

2. 0.75

\_\_\_\_\_  
\_\_\_\_\_

3. 0.6

\_\_\_\_\_  
\_\_\_\_\_

4. 0.45

\_\_\_\_\_  
\_\_\_\_\_

5. With a partner, write two different stories that use two equivalent fractions. Explain why the different fractions make more sense in your story. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Place the equivalent fractions in groups.

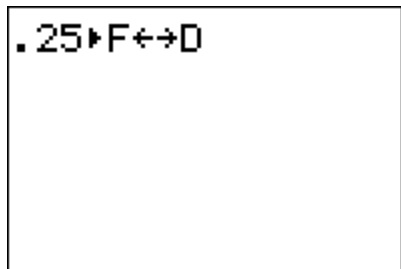
6.  $\frac{1}{2}, \frac{2}{3}, \frac{8}{16}, \frac{4}{9}, \frac{8}{12}, \frac{10}{20}, \frac{12}{27}, \frac{10}{15}, \frac{30}{45}, \frac{4}{6}, \frac{20}{45}$

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7.  $\frac{1}{3}, \frac{2}{7}, \frac{3}{5}, \frac{6}{10}, \frac{6}{21}, \frac{6}{18}, \frac{2}{6}, \frac{5}{15}, \frac{4}{14}, \frac{12}{20}, \frac{15}{25}$

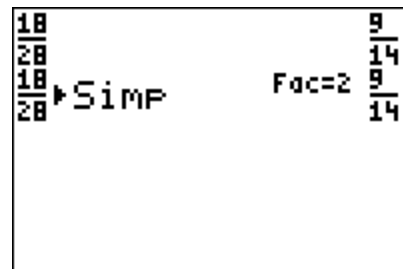
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

To convert a decimal to a fraction, press  $\boxed{.}$   $\boxed{2}$   $\boxed{5}$   $\boxed{F\leftrightarrow D}$   $\boxed{ENTER}$ .



To reduce a fraction and the Mode is set to **AutoSimp**, enter the fraction, then press  $\boxed{ENTER}$ .

Otherwise, use the  $\boxed{SIMP}$  key.





**Problem 2 – Greater Than or Less Than**

Find a fraction that meets each of the given conditions. Use the  $\boxed{F \leftrightarrow D}$  feature to help you find the needed fractions.

8. Greater than 0, Less than 0.25

Answer: \_\_\_\_\_

9. Less than 0

Answer: \_\_\_\_\_

10. Greater than 1

Answer: \_\_\_\_\_

11. Greater than 0.25 and Less than 0.30

Answer: \_\_\_\_\_

12. Between  $\frac{1}{3}$  and  $\frac{1}{2}$ .

Answer: \_\_\_\_\_

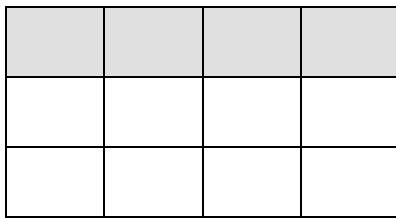
13. Greater than  $\frac{1}{2}$  and less than  $\frac{2}{3}$ .

Answer: \_\_\_\_\_

**Problem 3 – Visually Find Equivalent Fractions**

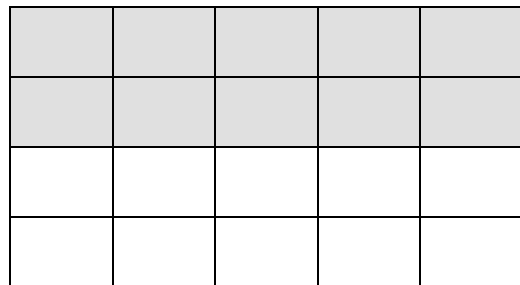
Write 2 equivalent fractions that are shown in each diagram.

14.



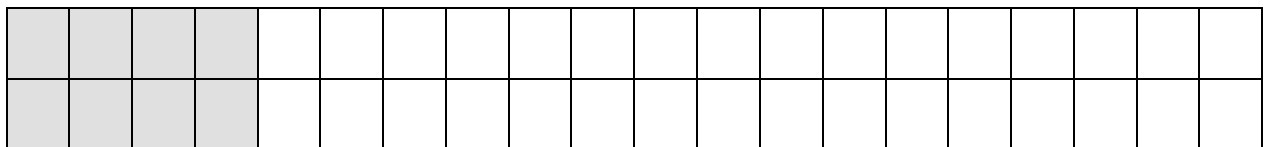
\_\_\_\_\_

15.



\_\_\_\_\_

16.



\_\_\_\_\_