

Percents – Small and Large
ID: 11268**Time Required**
*45 minutes***Activity Overview**

In this activity, students will explore percents greater than 100% and less than 1%. Students will use a 100 grid to represent percents and convert between fractions, decimals, and percents.

Topic: Numbers and Operations

- *Understanding numbers, representing numbers, and understanding relationships among numbers*
- *Comparing percents*
- *Using a 100 grid to represent percents*

Teacher Preparation and Notes

- *Students should have prior experience with converting decimals, fractions, and percents.*
- *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, TI-Navigator files, and list files go to education.ti.com/exchange and enter “11268” in the quick search box.***

Associated Materials

- *MGAct07_Percents_worksheet.pdf*
- *MGAct07_Nav_0to1_TI73.act*
- *MGAct07_Nav_0to100_TI73.act*
- *MGAct07_Nav_0to200_TI73.act*
- *PCNT.73I, FRAC.73I, DEC.73I (list files)*

Suggested Related Activities

To download any activity listed, go to education.ti.com/exchange and enter the number in the quick search box.

- *Percents Greater than 100 or Less than 1 (TI-73 Explorer) — 6671*
- *Percent Square (TI-73 Explorer) — 5217*
- *Picturing Percents (TI-15 Explorer) — 5709*

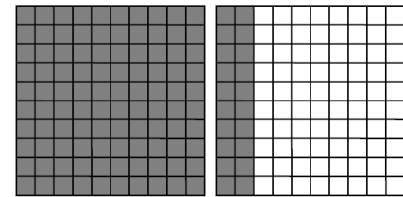
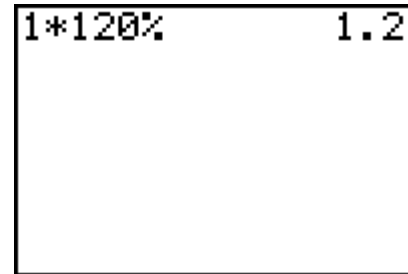
Problem 1 – Fundraiser Calculations

Joaquin is helping price items for the fund raiser garage sale. His target is to price all items at 120% of the original price.

Question 1

Have students do the multiplication by hand or on the TI-73. Key presses are $1 \times 120 \% \text{ [ENTER]}$.

Students should recognize that 100% is one full square. Then, 20% more is 20 squares in the following grid.

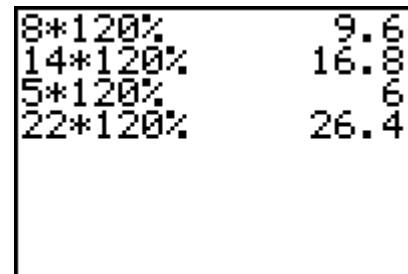


Question 2

Students should multiply each number by 120% to find the new price. Key presses for the examples to the right are $8 \times 120 \% \text{ [ENTER]}$, $14 \times 120 \% \text{ [ENTER]}$, $5 \times 120 \% \text{ [ENTER]}$, and $22 \times 120 \% \text{ [ENTER]}$.

Ask students questions about the pattern they see in the numbers. Are all numbers greater than the original number? By how much?

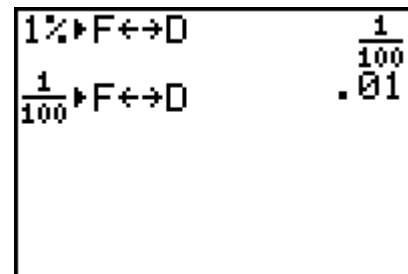
Have students take the new number, divide it by the old number, and see what they discover.



Question 4

If students use the TI-73 to perform these calculations, the key presses are $1 \% \text{ [F↔D] [ENTER]}$, then $\frac{1}{100} \text{ [F↔D] [ENTER]}$.

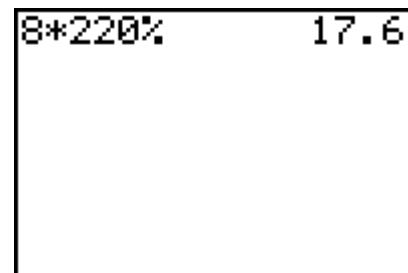
When students press [F↔D] the second time, the previous answer is copied as the input for this command.



Question 6

To calculate 220% of \$8, press $8 \times 220 \% \text{ [ENTER]}$.

Ask students to discuss how 17.6 relates to the amount they found in Exercise 2.

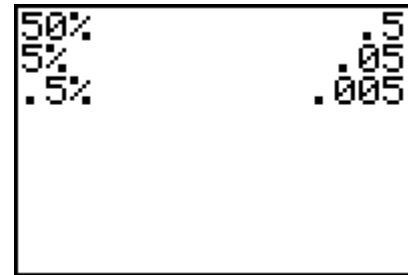


Problem 2 – Little Bits

In Problem 2, students explore percents less than 1%.

Question 7

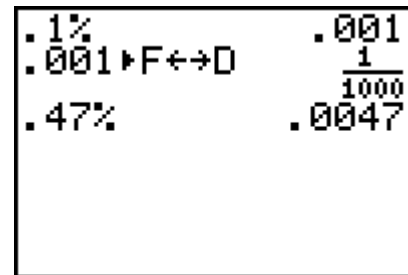
To convert from a percent to a decimal, enter the percent and press **[ENTER]**. For example, **[5] [0] [%] [ENTER]**.



Question 11

Students can convert 0.1% to a decimal and fraction by these key presses. **[.] [0] [%] [ENTER] [F<=>D] [ENTER]**.

When students try to convert 0.47% to a fraction, they will realize it does not work. The TI-73 is limited in the size of numerators and denominators that can be used. In this case, students will need to convert the decimal to a fraction without the use of the technology.



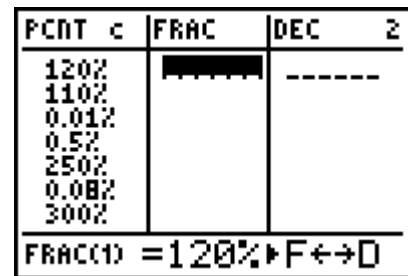
Extension – TI-Navigator™

1. Load the **Activity Center** settings for 0 to 200 percent, *MGAct07_Nav_0to200_TI73.act*. Give each student a percent greater than 100%. Students should place their cursor at the approximate location on the number line that represents their percent.

Other settings are saved in *MGAct07_Nav_0to1_TI73.act*. and *MGAct07_Nav_0to100_TI73.act* for use during different sections of the activity. Each can easily be obtained from the original *0to200* file simply by changing the configuration settings.

2. Use a **Quick Poll** to assess student understanding throughout the lesson. For example, after Exercise 3 in the activity, ask students how many squares were filled in for Exercise 1. (use “Open Response”) After Exercise 6, send a **Quick Poll** asking for 20% of \$8 and then have a class discussion about the relationship of 20%, 120% and 220%.

3. Send the lists **PCNT**, **FRAC**, and **DEC** to students. As shown at the right, the list PCNT contains seven different percentages and lists FRAC and DEC are empty. For students to set up the lists in the List Editor, press **[2nd] [CATALOG]** and select **SetUpEditor**. Then press **[2nd] [STAT]** and select the three lists. Have them convert the percents to fractions and decimals. To check their answer, students can use the commands they would use on the Home screen.

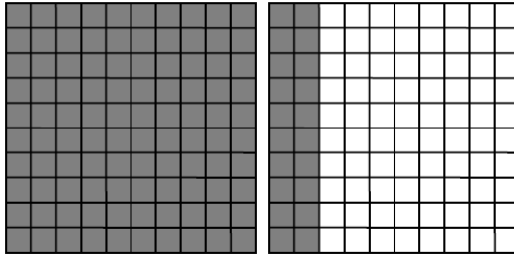


4. Use **Quick Poll** to ensure students understanding. Give students various decimals or fractions and prompt them to return where the number falls, below 1%, between 1% and 100% or over 100%. Students could respond 1 for less than 1%, 2 for 1-100%, and 3 for over 100%.

Solutions – Student Worksheet

Problem 1

1. \$1.20



2.

Original Price	Fundraiser Price
\$8	\$9.60
\$14	\$16.80
\$5	\$6
\$22	\$26.4

3. one percent

4. 1%, .01, $\frac{1}{100}$

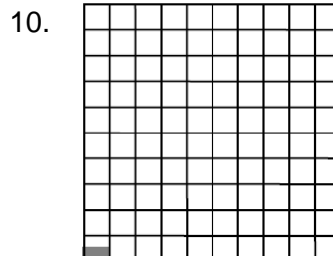
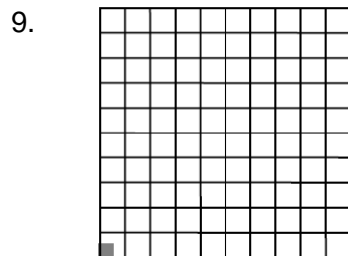
5. No, 220% cannot be represented on the grids in Exercise 1. They only represent 200%. Another grid would be needed.

6. \$17.60

7. 8×2.2

Problem 2

8. 0.5, 0.05, 0.005. Each decimal has one more zero to the left of 5. 0.5% represents one half of one percent.



11. Exercise 3 filled one square, or 1%. Exercises 9 and 10 do not fill even one square.

12. 0.001, $\frac{1}{1,000}$; 0.047, $\frac{47}{1,000}$; 0.0006, $\frac{6}{10,000}$



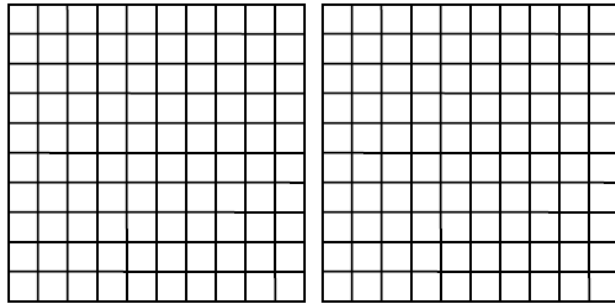
Problem 1 – Fundraiser Calculations

Joaquin is helping price items for the fundraiser garage sale. His target is to price all items at 120% of the original price.

1. One of the items costs \$1. Find the fund raiser price.

Multiplication

100 grid



2. Help Joaquin finish the following pricing chart for the fund raiser.

Key presses from the Home screen: (price) \times 1 2 0 % ENTER

Original Price	Fund Raiser Price
\$8	
\$14	
\$5	
\$22	

3. What does each square in Exercise 1 represent?

4. Write the percent, decimal, and fraction that one square represents.

Percent: _____ Decimal: _____ Fraction: _____

5. If you wanted to represent 220%, can you do that on the grids in Exercise 1? Why or why not? _____

6. Calculate 220% of \$8. _____

7. Describe another way to enter 220% of \$8 on the calculator without using the %.

Percents – Small and Large

Problem 2 – Little Bits

8. What does $\frac{1}{2}$ (or 0.5) of a percent mean? Convert the following percents to decimals. For example one, press $\boxed{5} \boxed{0} \boxed{\%} \boxed{\text{ENTER}}$.

50% = _____

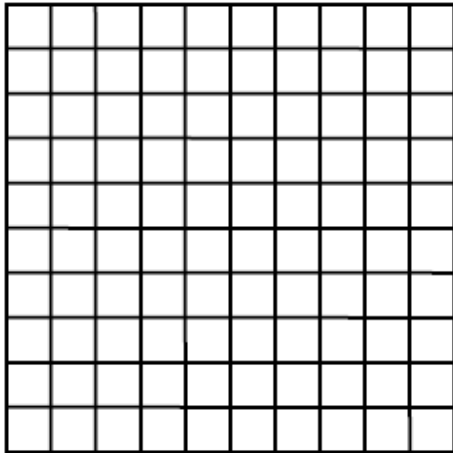
5% = _____

0.5% = _____

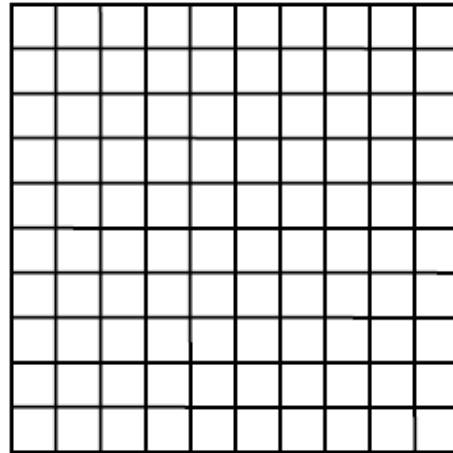
Describe what is happening with the decimals and percents. What does 0.5% represent? _____

Complete the following 100 grids with the given percent.

9. 0.25%



10. 0.5%



11. How does the shading of Exercises 9 and 10 compare to your answer for Exercise 3?
- _____
- _____

12. Convert the following percents to fractions and decimals. Use the $\boxed{\%}$ and $\boxed{\text{F} \leftrightarrow \text{D}}$ keys.

0.1%

Decimal: _____

Fraction: _____

0.47%

Decimal: _____

Fraction: _____

0.06%

Decimal: _____

Fraction: _____