



PRACTICE TASK: In the Paper

STANDARDS FOR MATHEMATICAL CONTENT

MCC5.NBT.3 Read, write, and compare decimals to thousandths.

- a. Read and write decimals to thousandths using base ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.
- b. Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
6. Reason abstractly and quantitatively.
7. Construct viable arguments and critique the reasoning of others.
8. Model with mathematics.
9. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

Students should have had prior experiences and/or instruction with writing fractions and decimal numbers. They should also have experience with creating bar graphs.

When students are creating a bar graph, talk with them about what the scale increments should be for their graph. Because all of the sections were equal in size, (100 words) it is possible to graph the frequency of occurrence for each type of word. However, because the focus is on writing and ordering decimal numbers, students could be asked to label the scale using increments of 0.10, 0.05, or as appropriate for the data. If decimal increments are used, students should be made aware that the fraction created by the number of occurrences out of 1000 words is called the “relative frequency.” Therefore, the vertical axis on the graph should be labeled “relative frequency.”

Common Misconceptions

A common misconception that students have when trying to extend their understanding of whole number place value to decimal place value is that as you move to the left of the decimal point, the number increases in value. Reinforcing the concept of powers of ten is essential for addressing this issue.

A second misconception that is directly related to comparing whole numbers is the idea that the longer the number the greater the number. With whole numbers, a 5-digit number is always greater than a 1-, 2-, 3-, or 4-digit number. However, with decimals a number with one decimal place may be greater than a number with two or three decimal places. For example, 0.5 is greater than 0.12, 0.009 or 0.499. One method for comparing decimals is to make all numbers have the

same number of digits to the right of the decimal point by adding zeros to the number, such as 0.500, 0.120, 0.009 and 0.499. A second method is to use a place-value chart to place the numerals for comparison.

ESSENTIAL QUESTIONS

- How do you order fractions?
- How are decimal numbers and fractions related?
- What is a fraction and how can it be represented?
- When is it appropriate to use fractions?

MATERIALS

- “In the Paper” students recording sheet
- A page from a newspaper
- Highlighters, crayons, or colored pencils

GROUPING

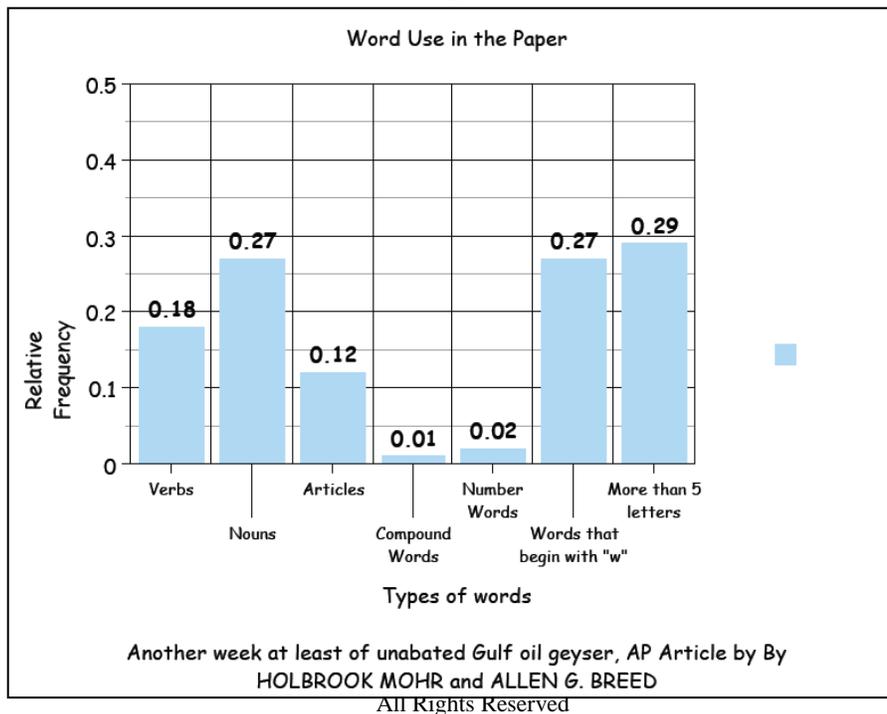
Individual/Partner Task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

In this task, students will explore the characteristics of words in a 100 word passage of a newspaper article. They will report their findings in decimal form and order decimals from smallest to largest.

Comments

This activity can be used as a Language Arts integration activity. The possibilities of calculating fractions of various words or word parts are endless.



Task Directions

Students will follow the directions below from the “In the Paper” student recording sheet.

Look through the newspaper and find an article that is interesting to you. Count the first 100 words in the article and put a box around that section with a highlighter or marker. Follow the directions in the table below.

Each Word Type Represents What Part of the Article Section?

Count the following types of words	Write the number as a decimal fraction	Write the number as a decimal number	Order the decimal numbers from smallest to largest
1. number of verbs			
2. number of nouns			
3. number of articles			
4. number of compound words			
5. number of number words			
6. number of words that began with “w”			
7. number of words with more than 5 letters			

Create a bar graph to present your data to the class.

- What is your graph title?
- What scale increments will you use?
- How will you label the horizontal axis of your graph?
- How will you label the vertical axis of your graph?
- What categories will you use?

FORMATIVE ASSESSMENT QUESTIONS

- How many of the words did you find? How many are in the part of the selection you identified?
- How do you represent that amount as a fraction? How do you represent that amount as a decimal number?
- Look at the fraction, which fraction is larger? How do you know? So, which decimal number is larger? How do you know?
- What will be the scale increments for your graph? Why did you choose the scale increments?
- What are the parts of a bar graph? Have you included them all in your graph?

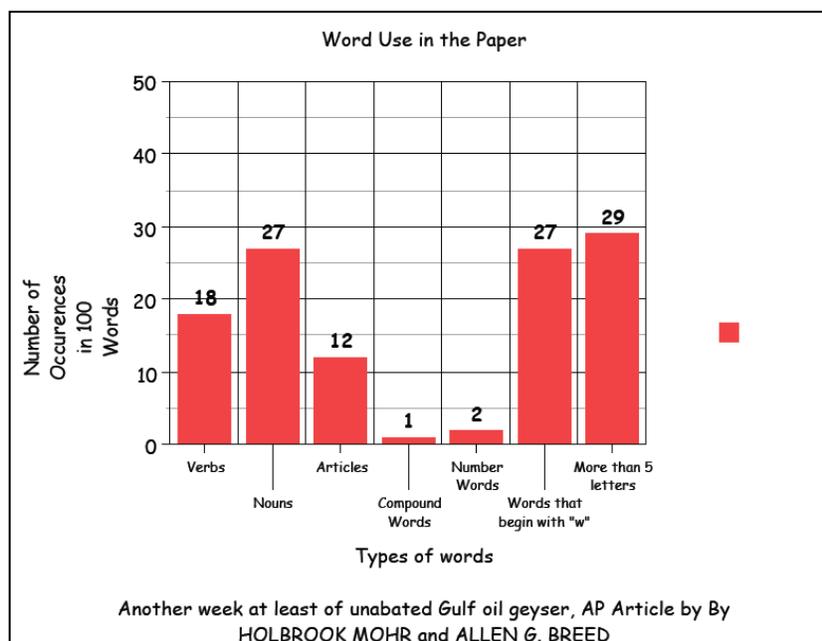
DIFFERENTIATION

Extension

- The decimal amount of words found in various categories can be compared between articles, thus comparing fractions in a different way.
- Students can decide on various categories of words to find and report their answer as a fraction.

Intervention

- Instead of a newspaper, books written at a student's reading level can be used. So students are able to write on the page(s), have students choose a book before beginning this task in class and make a copy of the page(s).
- Allow students to refer to a completed graph as a model for the graph they need to create. Use a completed graph such as the sample below.



Name _____ Date _____

In the Paper



Look through the newspaper and find an article that is interesting to you. Count the first 100 words in the article and put a box around that section with a highlighter or marker. Follow the directions in the table below.

Each word type represents what part of the article section?

Count the following types of words	Number of Occurrences	Relative Frequency		Order the decimal numbers from smallest to largest
		Write the number of occurrences as a fraction $\frac{\# \text{ of Words}}{100}$	Write the number of occurrences as a decimal number	
1. number of verbs				
2. number of nouns				
3. number of articles				
4. number of compound words				
5. number of number words				
6. number of words that began with "w"				
7. number of words with more than 5 letters				

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