

## **CONSTRUCTING TASK: In the Paper**



### **STANDARDS FOR MATHEMATICAL CONTENT**

**MCC4.NF.5** Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. *For example, express  $3/10$  as  $30/100$ , and add  $3/10 + 4/100 = 34/100$ .*

**MCC4.NF.6** Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite  $0.62$  as  $62/100$ ; describe a length as  $0.62$  meters; locate  $0.62$  on a number line diagram.*

**MCC4.NF.7** Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of the comparisons with the symbols  $>$ ,  $+$ , or  $<$ , and justify the conclusions, e.g. by using a visual model.

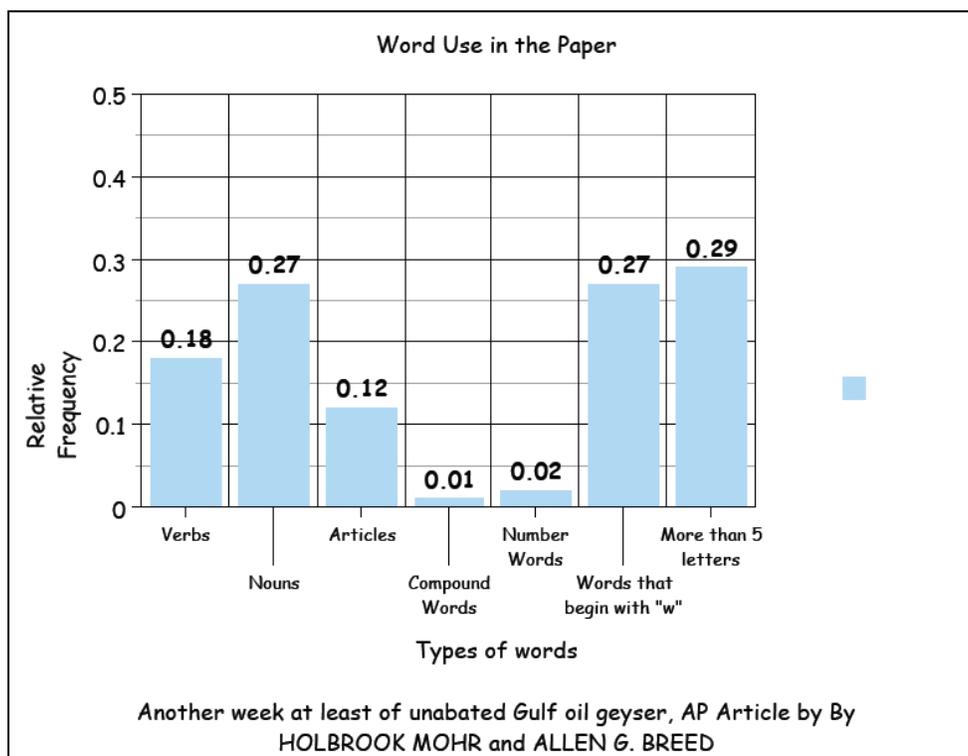
### **STANDARDS FOR MATHEMATICAL PRACTICE**

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

### **BACKGROUND KNOWLEDGE**

Students should have had prior experiences and/or instruction with writing decimal fractions and decimal numbers.

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 100 words is called the “relative frequency.” Therefore, the vertical axis on the graph should be labeled “relative frequency.” Example of a graph is shown below. The National Center for Education Statistics (NCES) Kids’ Zone (Create-a-Graph) was used to create the graphs. You’ll find the link under “Technology Connection” below.



### **ESSENTIAL QUESTIONS**

- How do you order two-digit decimal fractions?
- How are decimal numbers and decimal fractions related?
- What is a decimal fraction and how can it be represented?
- When is it appropriate to use decimal 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 decimal 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 decimal fraction? How do you represent that amount as a decimal number?
- Look at the decimal 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?

- Are students able to write correctly the decimal based on the number of identified words out of 100?
- What strategies are students using to order decimals?
- Which students are able to display the data using a bar graph?

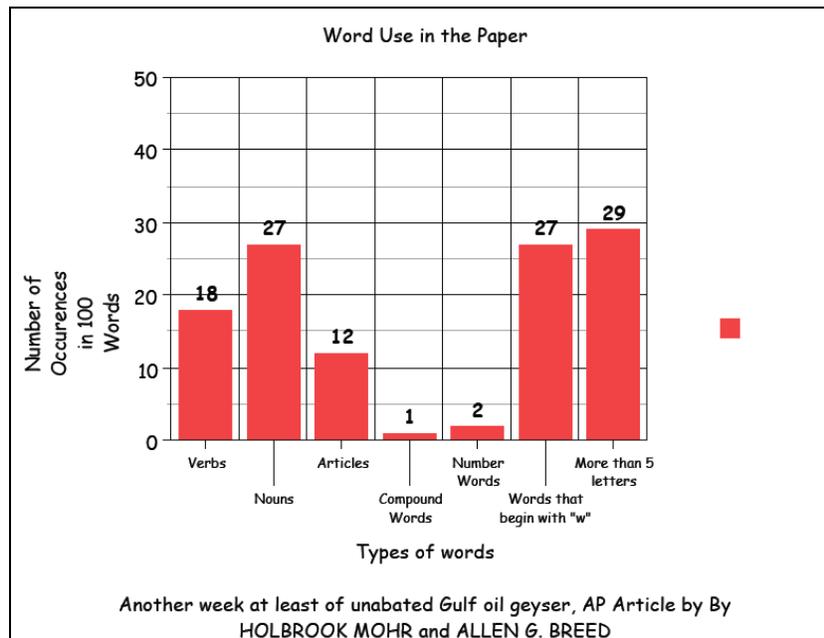
## **DIFFERENTIATION**

### **Extension**

- The decimal amount of words found in various categories can be compared between articles, thus comparing decimal fractions in a different way.
- Students can decide on various categories of words to find and report their answer as a decimal 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 use the web site below to create a graph to represent the data collected. Alternatively, 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 decimal 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				

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?