Where the Wild Things Are

Story and Pictures by Maurice Sendak

Harper Collins Publishers, 1963

Exploration

For this assignment you will measure, count, use ratios and make graphs in order to understand better the choices illustrators make. Math is everywhere, even in illustrations of children's literature. For future educators and parents, this assignment may also help you to think of ways to use children's literature as a fun way to explore math concepts. This assignment has three parts; each asks you to work with data as well as discuss how that data helps us understand the illustrators' work. You will need access to a copy of Maurice Sendak's book, Where the Wild Things Are *to complete this assignment.*

We will discuss this assignment for 30 minutes in today's class, reviewing the math skills you will be using to complete this work. The completed assignment is due at the beginning of our next class session. We will spend thirty minutes discussing your findings in our next class.

Task 1- Obtain and record the following data in the following chart. You will be using this data to complete the rest of the tasks:

1. Measure the dimensions (width and height) of each illustration in the text and record the data in the appropriate column of your chart.
2. For each illustration, write a ratio that compares width to height $\frac{width}{height}$.
4. Write the decimal equivalent of the width to height ratio.
5. Measure and record Max's height in each of the illustrations in the text.

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Illustration Number	*Illustration Width*	*Illustration Height*	*Ratio of Width to Height*	*Decimal Equivalent*	*Max's Height*
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

Task 2

Referring to the chart, discuss the following topics:

1. Describe in a short, typed paragraph what changes are happening with the dimensions of the illustrations. Then discuss how these changes support and extend the meaning of the text.

2. In mathematics and the arts, two quantities are said to form a **GOLDEN RATIO** if the ratio of one number to the other comes out to be close to 1.618. A **GOLDEN RECTANGLE** is formed when you have a rectangle in which the ratio of the width to height $\frac{width}{height}$ comes out close to 1.618. If the width is less than the height, the ratio would come out to be .618 and this is also considered to be "golden". Since the time of the Renaissance, many artists have proportioned their works to approximate the golden ratio / golden rectangle believing this proportion to be aesthetically pleasing.

> About 100 years ago, German psychologist Gustav Fechnerp tested hundreds of people to determine their preference for rectangles and found the average choice generally to be close to the golden rectangle. Over the years this fact has been heavily exploited by the advertising and retailing business in labels, ads, packages, and displays.[1]

Examine the ratios that you found for illustration # 1 and illustration #10. Find the decimal equivalent of each of these ratios. *Hint: divide the width by the height*. List the two ratios, then discuss in a short, typed paragraph your answers to the following two questions: (1) Do either of these illustrations come close to fitting the definition of a Golden Rectangle? (2) How does this fact affect how the illustrations support and extend the meaning of the text?

Task 3

1. To complete this task, use only the data for illustrations **1, 10, 13** and **15** from your chart and create *three* separate BAR GRAPHS:

On *each* graph use the ***x-axis*** to represent your illustration number.

Use the ***y-axis*** to represent:

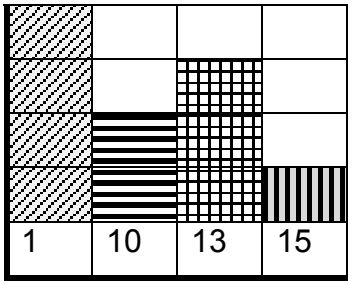
A. Graph 1 - Max's Height

B. Graph 2 - Illustration Width

C. Graph 3 - Illustration Height

[1] Fascinating Fibonaccis - Mystery and Magic in Numbers, by Trudi Hammel Garland,Dale Seymour Publications, Palo Alto, CA, 1987, p.20

Example:



If you need help creating a bar graph using Excel, refer to any of the following for a free tutorial.

http://spreadsheets.about.com/od/excelcharts/ss/bar_graph.htm

http://www.ncsu.edu/labwrite/res/gt/gt-bar-home.html

http://www.ehow.com/video_4767606_microsoft-excel-graph-tutorial.html

Make sure that you put a TITLE on EACH AXIS (X and Y) so it is clear what measurements are being graphed!

2. After looking at the both the first chart and these **three different** bar graphs, describe in a short, typed paragraph any changes in Max throughout the illustrations. Include your thoughts on how these facts support and extend the meaning of the text.

When you finish this assignment, you should have completed the chart, created three graphs and written three typed paragraphs discussing the data and how it helps you understand ways in which the illustrations support and extend the meaning of the text. All of this needs to be submitted to me for evaluation. You will be evaluated on the quality of the math portion of the assignment, accuracy of measurement, ratios and graphs, as well as the written discussion of the Sendak's use of illustrations to support and extend his text. Use of Standard English grammar, spelling, capitalization and punctuation is (as always) expected.

Math Help

Ratios, Proportions, and Percents

Ratios

A RATIO is used to show a comparison between two quantities

- There are three different notations that are used to indicate a RATIO:

  A to B A : B $\frac{A}{B}$

- Each of these notations would be read as A to B.
- The order of the quantities is very important when writing ratios! For example, if you say that you are going to compare the cost of a bag of potato chips to the cost of a pizza, you would write this as:

  Chips to pizza chips : pizza $\frac{chips}{pizza}$

A bag of potato chips costs about $2.99 and a large pizza with toppings costs around $15.99. If you switch the order and write $\frac{\$15.99}{\$2.99}$ someone is going to get the impression that you really paid too much for the bag of chips!

For more information on this topic: *What is a RATIO?* Check these websites:

http://www.mathleague.com/help/ratio/ratio.htm

http://www.purplemath.com/modules/ratio.htm

http://mathforum.org/library/drmath/sets/select/dm_ratio.html

http://www.syvum.com/cgi/online/serve.cgi/gmat/math_review/ratio_1.html

Converting a Ratio to a Decimal

To convert a ratio to a decimal, divide the numerator (top number) by the denominator (bottom number).

$\frac{a}{b}$ $b\overline{)a}$

$\frac{3}{5}$ $5\overline{)3.0}$ $\quad .6$

For more information on this topic: *How to Convert a ratio (fraction)to a decimal,* Check these websites:

http://www.purplemath.com/modules/percents2.htm

http://www.mathsisfun.com/converting-fractions-decimals.html

http://www.youtube.com/watch?v=Gn2pdkvdbGQ

Proportions

A PROPORTION is a statement that 2 ratios are equal.

Examples: $\frac{a}{b}=\frac{c}{d}$ $\frac{5}{6}=\frac{10}{12}$

We can determine if two ratios really do form a true proportion by using the Cross Product method. If the cross products are equal, then the proportion is true. Here is how to do this method:

$\frac{a}{b} = \frac{c}{d}$

When you multiply across the = sign, you get the products

$a \cdot d$ and $b \cdot c$

If ad = bc then the proportion is true.

For more information on this topic: *What is a Proportion?* Check these websites:

http://www.math.com/school/subject1/lessons/S1U2L2GL.html

http://en.wikipedia.org/wiki/Proportionality_(mathematics)

http://www.purplemath.com/modules/ratio2.htm

Percent

PERCENT means PER ONE HUNDRED. The % symbol is used to denote percent.

Since percent means "per hundred", if we have 7% this means 7 per hundred and it can be written as either a fraction with a denominator of 100 or as a decimal written to the hundredths place (two places after the decimal point):

$$7\% = \frac{7}{100} = .07$$

TO CONVERT FROM A PERCENT TO A DECIMAL, drop the % symbol and multiply by 0.01. Another way to do this would be to drop the % symbol and move the decimal point over two places to the left.

75% = (75)(0.01) .5 or

From Percent	To Decimal	
75% 0.75 	0.75	move the decimal point **2 places to the left**, and remove the "%" sign.

TO CONVERT FROM A DECIMAL TO A PERCENT, multiply the decimal by 100 and place the % symbol behind the resulting number.

The easiest way to multiply by 100 is to just move the decimal point 2 places to the right:

From Decimal	To Percent	
0.125 0.12.5 	12.5%	move the decimal point **2 places to the right**, and add the "%" sign.

For more information on this topic: *Converting between Fractions, Decimals, and Percents* check these websites:

http://www.purplemath.com/modules/percents.htm

http://www.mathsisfun.com/decimal-fraction-percentage.html

http://www.mathgoodies.com/lessons/vol4/meaning_percent.html

Golden Ratio

For more information about the Golden Ratio check out the following:

http://www.mcs.surrey.ac.uk/Personal/R.Knott/Fibonacci/fib.html

http://en.wikipedia.org/wiki/Golden_ratio

http://mathforum.org/dr.math/faq/faq.golden.ratio.html

http://www.geocities.com/jyce3/