

New Unit - Data Analysis and Statistics!

* Today: Sec. 13.1 - Frequency Distributions & Graphs

Homework: 13.1 #3, 5, 7, 9, 11, 13, 15, 23, 36*

* Refer to #35's answer in back of book to do #36

Present Thursday: #3, 13, 36

*Also read the
CCSS Handout.*

9:55: Chelsea Sc., Molly, Amy, Jared, Briana, Rachel We.

11:00: Abbey Se., Kelly, Jeffrey, Kayla, Kelly, Calli Vi.



(Next quiz will be Tuesday, March 1)

Data Analysis - Basic Terms

Raw data may consist of numerical (**quantitative**) or non-numerical (**qualitative, or categorical**) data.

Examples:

- * Width of your desk, in paper clips. **quantitative**
- * 2nd graders' favorite color **categorical**
- * Length of your pencil / pen (to the nearest 1/2-inch) **quantitative**
- * Time spent on HW last night, to the nearest 1/4 hour **quantitative**

Work together to measure the width of your desk in pc's (paper clips). Record your answer on the Smartboard.

Width (pc's)

Measurement and Data 2.MD

Represent and interpret data.

9. Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

Create a line graph of this data. What is the difference between the shortest and longest measurement?

22
20
20
17
19
19
20



Measurement and Data

2.MD

10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems⁴ using information presented in a bar graph.

Example: Here's the frequency (and relative frequency) distribution for 2nd graders' favorite colors.

Color	Frequency	Relative Frequency
Red	6	6/20 = 30%
Purple	8	8/20 = 40%
Green	1	1/20 = 5%
Blue	5	5/20 = 25%

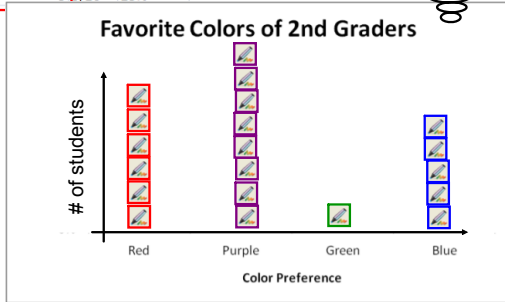
This is categorical data! A picture graph or bar graph are appropriate options for presenting them graphically. (A circle graph is ok too).

Example: Here's the frequency (and relative frequency) distribution for 2nd graders' favorite colors.

Color	Frequency	Relative Frequency
Red	6	$6/20 = 30\%$
Purple	8	$8/20 = 40\%$
Green	1	$1/20 = 5\%$
Blue	5	$5/20 = 25\%$

How many people like either green or blue? How many more like purple than red?

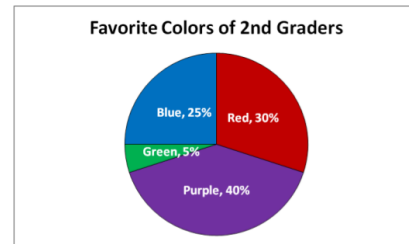
A Picture Chart



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A Pie Chart (or Circle Graph):



Statistics and Probability

6.SP

Develop understanding of statistical variability.

1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.

Example: Forty students, selected randomly, were asked to estimate the number of hours they had spent studying in the past week. Their responses were:

18 60 72 58 20 15 12 26 16 29
 26 41 45 25 32 24 22 55 30 31
 55 39 29 44 29 14 40 31 45 62
 36 52 47 38 36 23 33 44 17 24

Statistics and Probability

6.SP

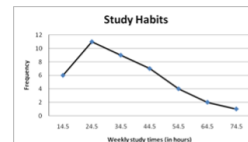
Summarize and describe distributions.

4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

A histogram or a frequency polygon is commonly used to summarize quantitative (numerical) data.

Tabulating a grouped frequency distribution is the first step for creating either type of graphical display.

Rule of thumb: Use between 5 and 12 uniform, non-overlapping classes (groups) that span the entire data set.



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 26 41 45 25 32 24 22 55 30 31
 55 39 29 44 29 14 40 31 45 62
 36 52 47 38 36 28 33 44 17 24

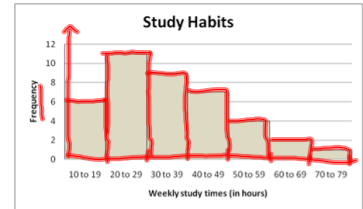
Class limits	Tally	Frequency	Rel. Freq.
10-19		6	$\frac{6}{40} = 15\%$
20-29		11	$\frac{11}{40}$
30-39			
40-49			
50-59			
60-69			
70-79			

Example: Forty students, selected randomly, were asked to estimate the number of hours they had spent studying in the past week. Their responses were:

Frequency Distribution

Classes	Frequency
10 to 19	6
20 to 29	11
30 to 39	9
40 to 49	7
50 to 59	4
60 to 69	2
70 to 79	1

Histogram



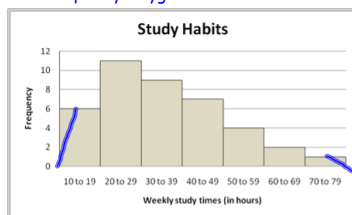
Remember to include a meaningful title as well as labels on both the vertical and horizontal axes!

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Frequency Distribution

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Frequency Polygon



Remember to include a meaningful title as well as labels on both the vertical and horizontal axes!

A back-to-back stem and leaf plot is useful for comparing two data sets.
 You can also make a "double-stem" by splitting the stem categories in halves.

Here are 21 ACT scores for randomly selected students in Wisconsin and another state. Is there a difference between these two groups?

Not Wisconsin	ACT - NonWis	ACT - Wisc.	Wisconsin
23 22 23	2 1		31 26 23
12 23 22	7 5 1 5 7 8 9		32 24 25
25 22 30	4 4 3 3 3 2 2 2 1 0 0 2 0 0 1 2 2 3 3 4 4		25 22 30
17 28 29	9 8 6 5 2 5 5 6 8 9		17 18 19
15 21 20	0 3 0 1 2		15 21 20
20 24 24	3		20 28 24
22 26 23			22 29 23