

Organizing Statistical Data

Frequency Distribution

- ▶ A table that displays the frequency of various outcomes in a sample
- ▶ Each entry in the table contains the frequency, or **COUNT**, of the occurrences within a particular group or interval.
- ▶ The table summarizes the **DISTRIBUTION** of values in the sample.

Frequency Distribution Table

Height of Children

Height (cm) of children	Absolute frequency	Relative frequency
120 – less than 130	9	18%
130 – less than 140	10	20%
140 – less than 150	13	26%
150 – less than 160	11	22%
160 – less than 170	7	14%
Total	50	100%

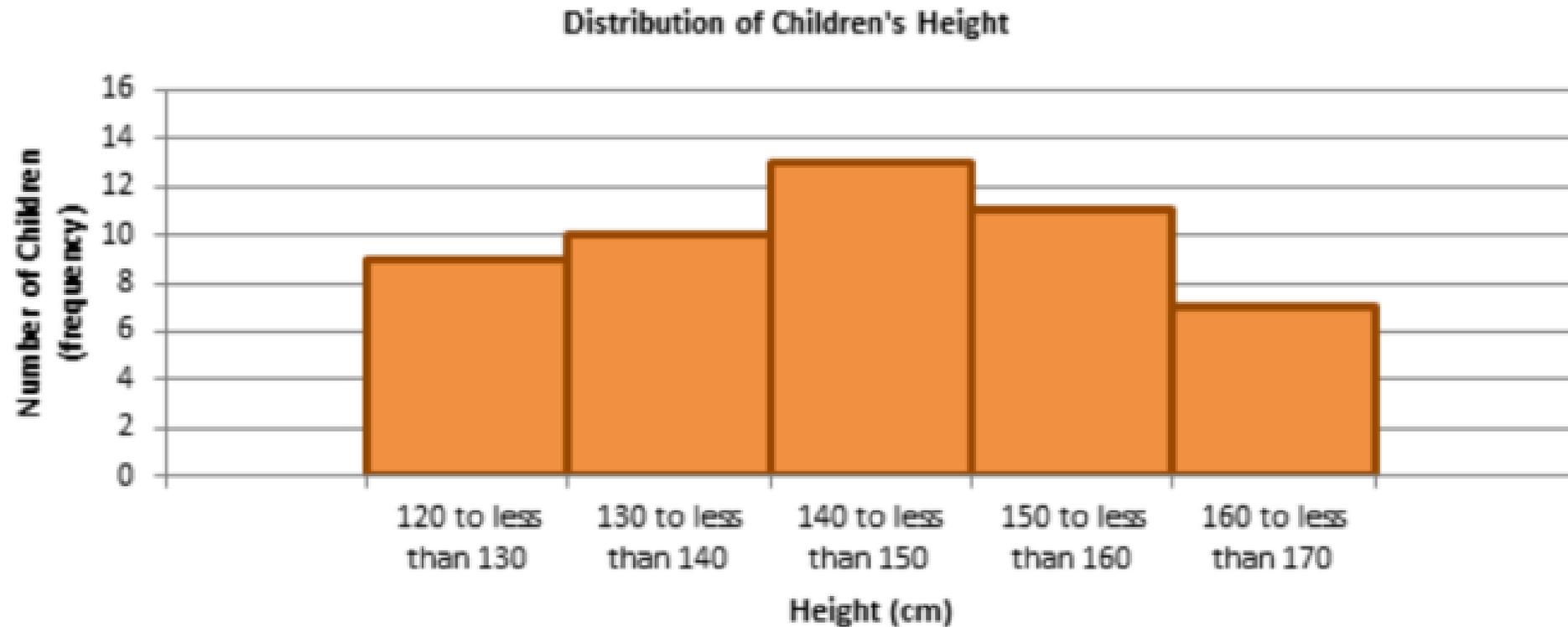
- 1) How many children are in the 160 to less than 170 range? **7**
- 2) In which range do most of the children fall?

140 to less than 150

Histogram

- ▶ A visual display that shows the frequency in columns on a graph.
- ▶ Y-Axis: frequency **COUNT** (how many items fell in that interval)
- ▶ X-Axis: variable being **MEASURED** (the measures, or intervals)

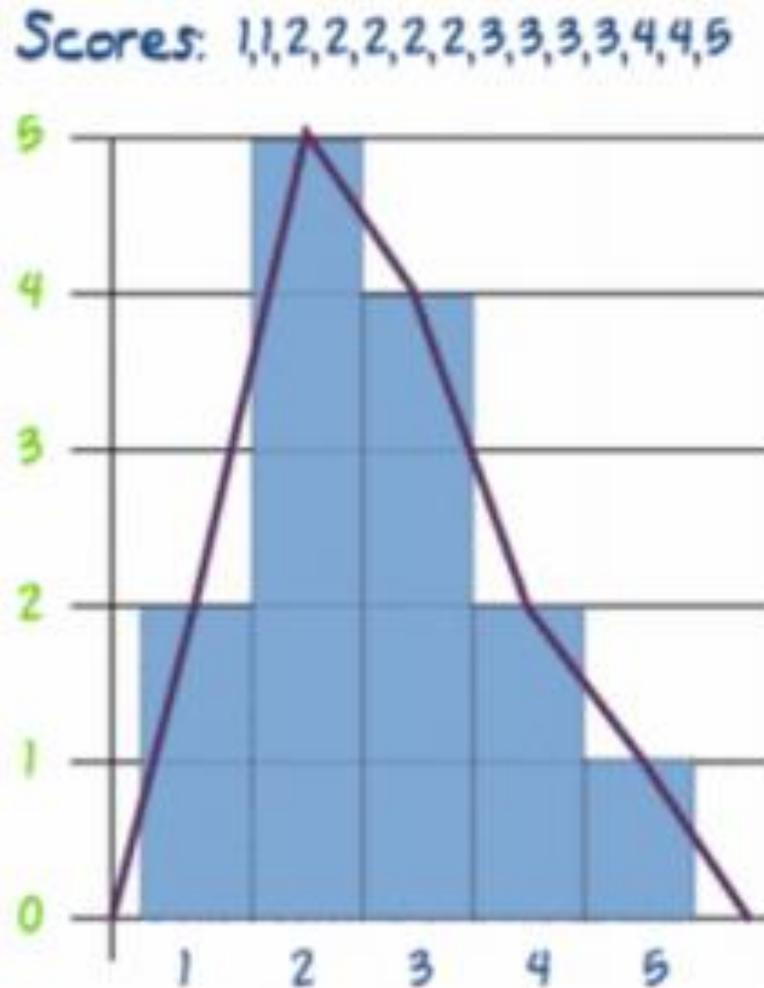
Histogram (Example)



Frequency Polygon

- ▶ Displayed on top of the histogram to better understand the **shape** of the distribution
- ▶ To make a Frequency Polygon:
 - ▶ Mark the **middle** of each bar in the histogram.
 - ▶ Start at the x-axis and draw a line to each middle point you marked, ending back at the x-axis!

Frequency Polygon (Example)



The purple line is the frequency polygon plotted on top of the histogram.

Stem and Leaf Plot

- ▶ The **STEM** is the left side
- ▶ The **LEAF** is the right side.
- ▶ Written in numerical order, increasing!

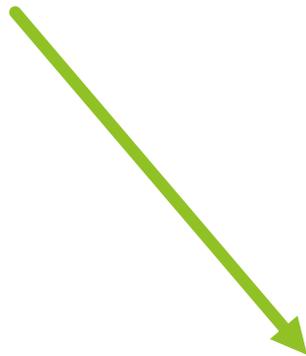
Stem and Leaf Plot (Example)

Test grades	
stem	leaf
4	2
5	
6	7
7	3 8
8	2 4 6
9	1 4 9

For this Stem and Leaf Plot, the **STEM** contains the tens digits and the **LEAF** contains the ones digits.

But what if you have larger or smaller numbers??

Just do the same thing, but make a key for readers to understand.



task completion times

stem	leaf
5	8 9
6	1 2 8
7	3 4 6 7
8	1 1 2 8
9	2

key: "9 | 2" means "9.2"

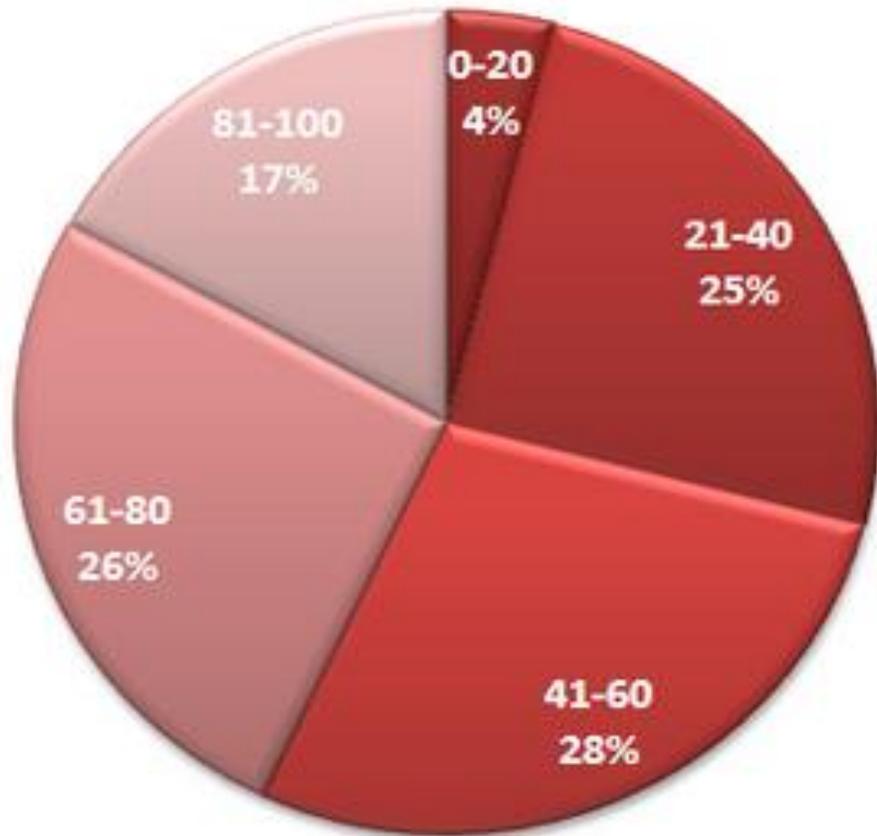
**Only the last digit of the number goes on the leaf side. Everything else goes on the stem side. Make a key!*

Pie Chart

- ▶ Represented in a circular shape to show the **percentage** of the data entries that fall in each interval.
- ▶ Same intervals as histogram and frequency distribution.

Pie Chart (Example)

Test Score Distribution for range of marks



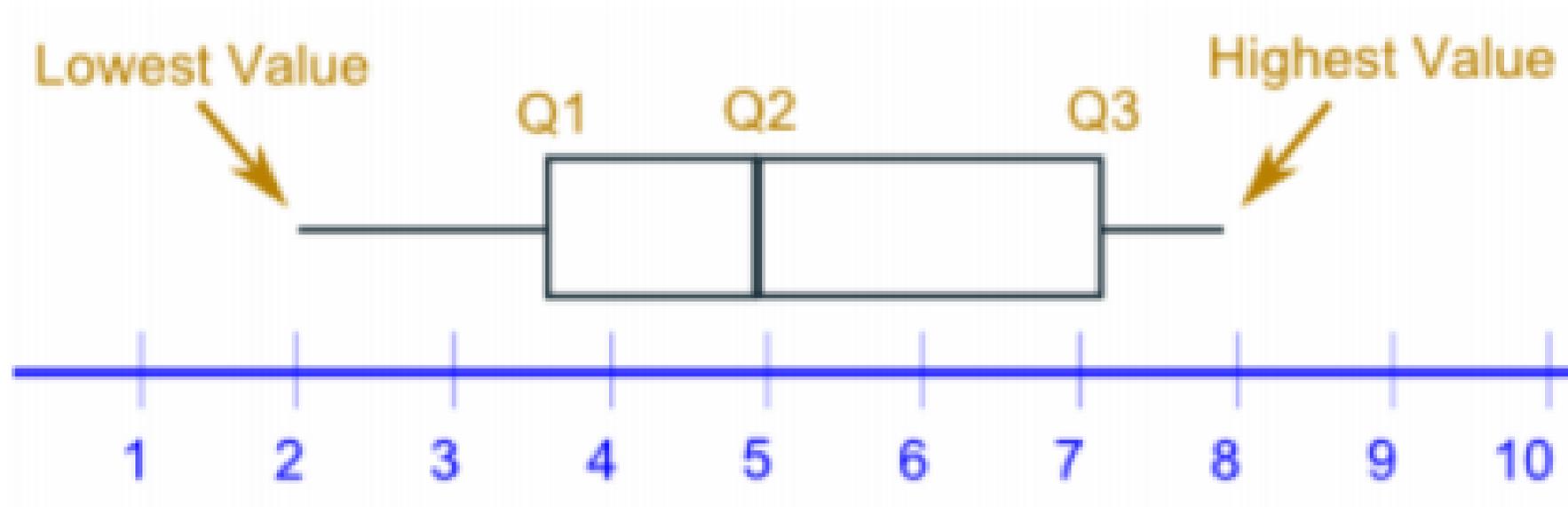
If 500 students took the test, how many total students scored between an 81 and 100?

85 Students

Box and Whisker Plot

- ▶ To create a box-and-whisker plot, you start by **ordering** your data- if they aren't ordered already.
- ▶ Next, find the median of your data. The median divides the data into two halves. Mark the median above a number line at the correct spot.
- ▶ To divide the data into quarters, find the medians of each of these two halves. Mark these above the number line.
- ▶ Mark the highest and lowest points above the number line.

Box and Whisker Plot (Example)



Now it's your turn to organize data.

- ▶ Think of an **appropriate** question that can be used to survey all of the students in the class.
- ▶ The answer to the questions **MUST BE quantitative** (not categorical).
- ▶ Collect data from every student in the class and represent your data on poster paper by organizing it in the **5 ways** we have learned about today.
 - ▶ 1) Frequency Distribution Table
 - ▶ 2) Histogram with a Frequency Polygon
 - ▶ 3) Stem and Leaf Plot (with a key)
 - ▶ 4) Pie Chart (with a key)
 - ▶ 5) Box and Whisker Plot