



Part 1: For each set of data, find the median, the first and third quartiles, the IQR, and the range.

How many photos are in your camera roll on your cell phone?

Data Set 1: Girls

30 ← Q₁: 48.5
 67
 514 ← MEDIAN
 1320 ← Q₃: 2160.5
 3001

IQR: $2160.5 - 48.5 = 2112$

Range: 3001-30

Median: 514 MIN: 30
 Q1: 48.5 MAX: 3001
 Q3: 2160.5
 IQR: 2112
 Range: 2971

Data Set 2: Boys

2
 5
 9 ← Q₁: 7
 137
 292 ← MEDIAN: 214.5
 332
 603 ← Q₃: 467.5
 3473

IQR: $467.5 - 7.0 = 460.5$

Range:

Median: 214.5
 Q1: 7
 Q3: 467.5
 IQR: 460.5
 Range: 3471

SPREAD

Compare the medians and measures of variation for each distribution.

- Girls' median is larger than boys'
- Boys have a greater spread - girls are more alike in how many pictures they take $\frac{1}{2}$ boys are less alike.

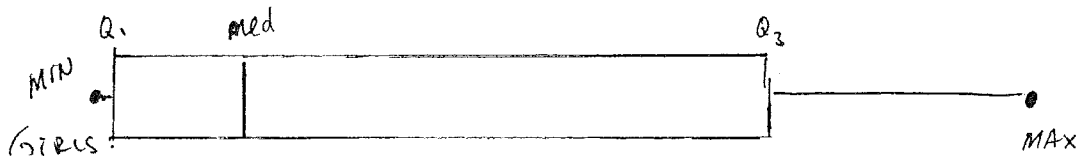
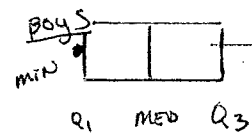
• One way to display data is through the use of the histogram, which is a great way to see how the FREQUENCY of data is distributed among a group.

• To look how the VALUES of data are distributed within a group, a BOX PLOT can be used. From the group, all you need is:

- The minimum (*the least value*)
- Quartile 1
- Median
- Quartile 3
- The maximum (*the greatest value*)

Box plots of two data sets:

- ① Number line
- ② MIN & MAX: DOTS
- ③ MED, Q₁, & Q₃: BOX



Example set #1: Use the data to make a box-and-whisker plot.

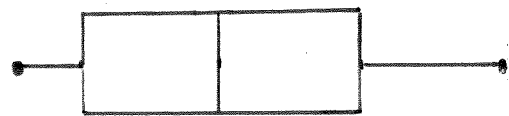
a. 71, 79, 56, 24, 35, 37, 81, 63, 75

24, 35, 37, 56, 63, 71, 75, 79, 81
 ↓ ↓ ↓
 Q₁ = 36 MED Q₃ = 77



b. 210, 195, 350, 250, 260, 300

195, 210, 250, 260, 300, 350
 ↓ ↓ ↓
 Q₁ MED: 250 Q₃



Part 2: Extreme Values

- In a data set, some values are very extreme compared to the rest. Do you think we have any extremely big or small values in the first data set? If so, which ones, and what about them seem extremely different?

NICK?

any number greater than this is an outlier. →

$$= 467.5 + (1.5)(460.5)$$

$$= 467.5 + 690.75$$

$$= 1,158.25$$

- These extreme values are called OUTLIERS; an extreme value defined as any number less than $Q_1 - (1.5)(IQR)$ OR any number more than $Q_3 + (1.5)(IQR)$.

DATA SET 1: Boys

- Looking at our data, do we have any outliers by definition?

$Q_1 - 1.5(IQR)$
 $7 - 1.5(460.5)$
 $7 - 690.75$
 anything smaller than
 -683.75

$Q_3 + 1.5(IQR)$
 [on previous page]
 anything greater
 than 1158.25

YES
 Nick is our
 ONLY OUTLIER,
 AS HE HAD
 3473 PHOTOS.

Example set #2:

- a. Identify if there are any outliers from the data set 2.

$Q_1 - 1.5(IQR)$
 $48.5 - 1.5(2112)$
 $48.5 - 3168$
 any value smaller than -3119.5

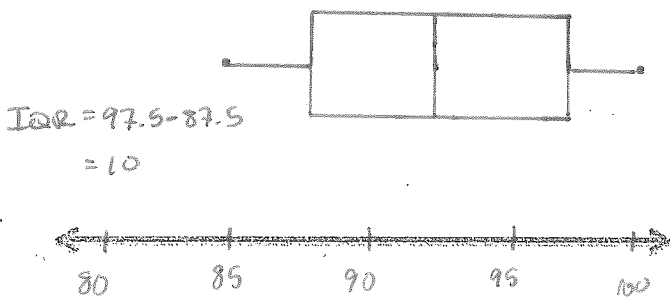
1: Girls
 $Q_3 + 1.5(IQR)$
 $2160.5 + 1.5(2112)$
 $2160.5 + 3168$
 any value bigger than $5,328.5$

NO OUTLIERS FOR
 GIRLS - ALL DATA
 WAS WITHIN THESE
 VALUES

- b. The number of members in eight workout clubs are 100, 95, 90, 85, 85, 95, 100, and 90.

- Create a box plot of the data.

$85, 85, 90, 90, 95, 95, 100, 100$
 $Q_1 = 87.5$ MED: 92.5 $Q_3 = 97.5$



- Suppose that a new workout club opens and immediately has 150 members. Is this number of members at this new club an outlier? Prove your response.

$Q_1 - 1.5(IQR)$
 $87.5 - 1.5(10)$
 $87.5 - 15$
 72.5

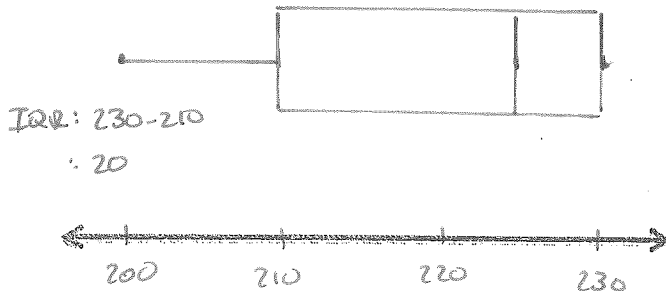
$Q_3 + 1.5(IQR)$
 $97.5 + 1.5(10)$
 $97.5 + 15$
 112.5

150 is a
 BIGGER VALUE
 THAN THE UPPER
 BOUNDARY FOR THE UPPER OUTLIER.

- c. The average bowling scores for a group of bowlers are 200, 210, 230, 220, 230, 225, and 230.

- Create a box plot of the data.

$200, 210, 220, 225, 230, 230$
 $Q_1 = 210$ MED: 225.5 $Q_3 = 230$



- Supposed that a new bowler joins this group and has an average score of 185. Is this bowler an outlier in the data set?

$Q_1 - 1.5(IQR)$
 $210 - 1.5(20)$
 $210 - 30$
 180

$Q_3 + 1.5(IQR)$
 $230 + 1.5(20)$
 $230 + 30$
 260

185 is WITHIN
 THESE BOUNDARIES
 SO IT IS NOT AN
 OUTLIER.

Exit Ticket: If you had an outlier in the data set, would you throw it out? Explain your opinion.

