Statistics Unit 1 worksheet: Describing a distribution

Name _____ Date _____ Period _____

1. Jin measured every pencil in his class's pencil cup and wrote this description, one sentence at a time.

- Sentence 1: "I measured the 18 pencils in our class's pencil cup with a ruler, to the nearest centimeter."
- Sentence 2: "The lengths are skewed left: most pencils are 14 to 19 cm long, and a few worn-down ones trail off to the shortest, a stub of 6 cm."
- Sentence 3: "The median length is 16 cm, and the middle half of the pencils are 13 to 17.5 cm long, an IQR of 4.5 cm."
- Sentence 4: "A typical pencil in the cup is about 16 cm long."

(a) For each sentence, name the piece of a description it gives (context, shape, center and spread, unusual features, or the answer to the question).

(b) Which piece is missing?

(c) Use the numbers in Sentence 3 to decide whether the 6 cm stub is an outlier. Then write the missing sentence.

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2. Olivia's class measured the 36 carrots in a grocery crate, to the nearest centimeter, and kept only the five-number summary: minimum 8, $Q_1 = 14$, median 17, $Q_3 = 19$ and maximum 21 cm.

For each claim, write confirmed, refuted, or cannot be checked from the summary, and give the reason.

(a) "The middle half of the carrots are 14 to 19 cm long, an IQR of 5 cm."

(b) "The lengths are skewed left."

(c) "The shortest carrot, 8 cm, is an outlier."

(d) "There are no outliers at all."

(e) "No carrot is between 9 and 13 cm long."

(f) "The mean length is 16 cm."

3. Mason bought a big pack of small notepads, each sold as about 20 sheets. He counted the sheets in 10 of them: 20, 18, 21, 20, 19, 22, 20, 19, 21, 20.

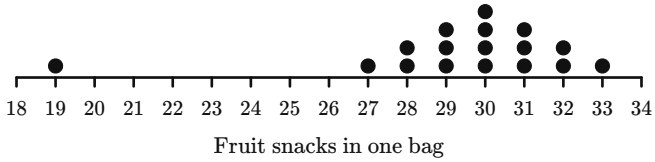
(a) Find the mean, the MAD, the median and the quartiles, and test for outliers.

(b) Name the shape, choose a center and a spread, and write a description that answers "How many sheets are in a notepad from this pack?"

(c) Mason then finds an 11th notepad in the pack, made of much thinner paper, that holds 34 sheets. Which center and spread should the description use now? Find them, and test the 34 for being an outlier.

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4. Grace opened 17 fun-size bags of fruit snacks and counted the pieces in each bag. Her summaries: mean about 29.4, median 30, $Q_1 = 28.5$ and $Q_3 = 31$ pieces.



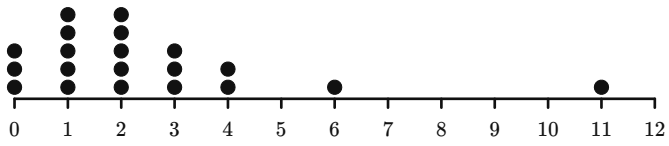
Fruit snacks in one bag

(a) Test the bag with 19 pieces and the bag with 33 pieces for being outliers.

(b) Which center and spread should Grace's description use? Explain.

(c) Write a description that answers "How many fruit snacks are in a fun-size bag?" Include any gap.

5. Leah asked the 20 students in her class how many library books each one checked out this month, and drew the dot plot. Hiro wrote this description of her data:



Library books checked out

"The 20 students checked out a mean of 2.45 books, with a MAD of about 1.7 books. The counts are roughly symmetric, and there are no outliers."

(a) Use the dot plot to check Hiro's mean and MAD.

(b) Which of Hiro's claims are wrong? Use the shape of the plot and the fences.

(c) Write a better description that answers "How many library books does a student in Leah's class check out in a month?"

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