Assessment and the CCSSM

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In this assignment, there will be two formative post assessment for the first two weeks' lessons. The goal is exploring evidence of students' mastery by developing an additional assessment for the lessons. After evaluating the data of these assessments, the result will guide my instructional planning. "Creating lessons that align with the Common Core Standards and coherent is vital for today's teachers" (Cook, 2017).

Week 1:

Common Core State Standard (CCSS) 6.SP.B.4 which states that students will be able to display numerical data in plots on a number line, including dot plots, histograms, and box plots.

My students will demonstrate their knowledge on given an assessment (Appendix A) after a week of teaching and practicing for the standard. As a teacher, I would like to see the outcome of the week within a formative assessment after instructing the details of the lesson. The students need to get at least 7 out of 10 questions in order to qualify for the next lesson. If not, some of my students will continue to practice until I feel they are understanding and able to do practice questions smoothly. There will be different types of questions which students can express their knowledge by solving numerical response, multiple choice, and word problem questions.

Week 2:

Common Core State Standard (CCSS) 6.SP.B.5b which states that students will be able to describe the nature of the attribute under investigation, including how it was measured and its units of measurement.

My 6th-grade students will be getting a quiz (Appendix B) after learning and practicing about the standard. Overall, they will have similar procedures with the previous week. After having so many practice questions and real life examples through the week, students will demonstrate their knowledge on the formative assessment. The students need to get at least 7 out of 10 questions in order to qualify for the next lesson. There will be different types of questions which students can express their knowledge by solving numerical response, multiple choice, and word problem questions. After getting the outcome, all the students and I will go over the questions in a short time to strengthen their math skills. My students will be either in a small group or one on one to help each other while I walk around the class to make sure everyone is engaged and try to understand. Also, students who achieved low scores will continue practice on some math websites such as Khan Academy or Study Island to improve their math skills during the after school tutoring time or at home before the next lesson.
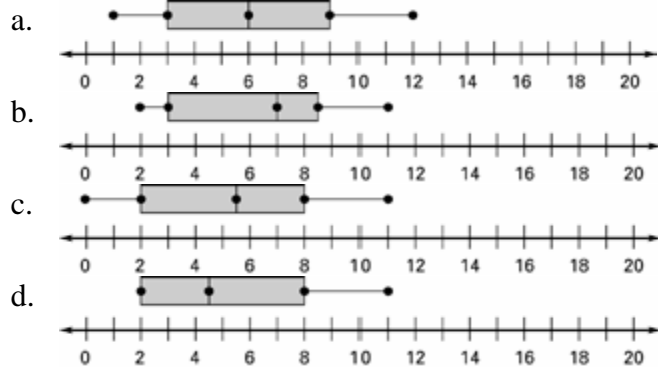
Appendix A

Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. Which data set could the histogram represent?

Text Messages
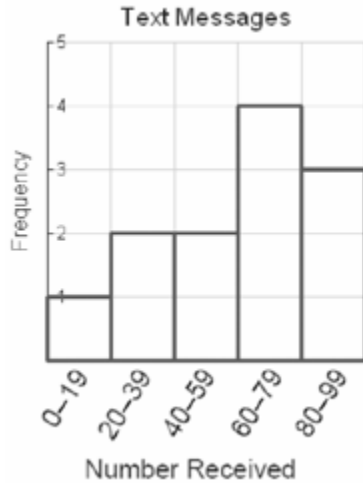
   a. 6, 21, 33, 45, 59, 68, 70, 76, 79, 82, 94, 96
   b. 6, 21, 33, 39, 59, 68, 70, 76, 79, 82, 94, 96
   c. 6, 21, 33, 45, 59, 68, 70, 76, 83, 85, 94, 96
   d. 6, 12, 33, 45, 59, 68, 70, 76, 79, 82, 94, 96

2. Which is the correct box-and-whisker plot for the data set?
      3, 2, 11, 8, 9, 8, 7, 3, 5

3. Kendra asked her friends how many pets they each had in their family. Her results are shown below.
   4, 2, 1, 1, 0, 2, 7, 3, 1, 0, 0

   Which is a histogram of the data?

a.

b.

c.

d.
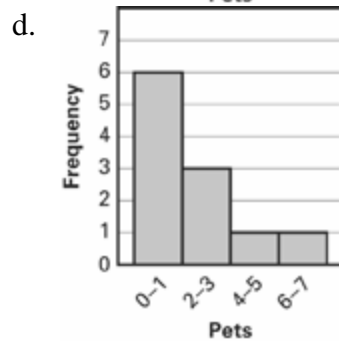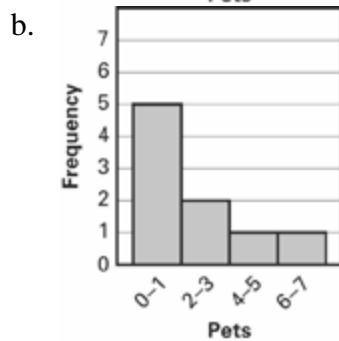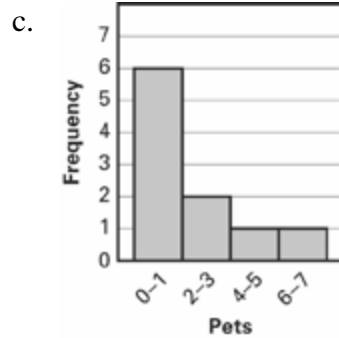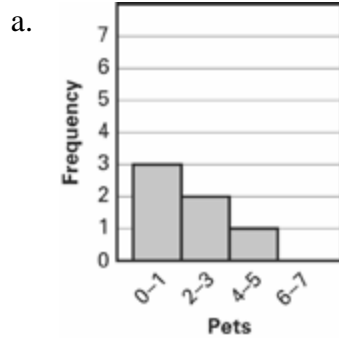
4. What is the value of the upper quartile in the box plot shown?
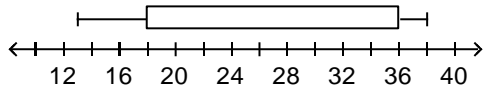
a. 18
b. 20
c. 36
d. 38

Short Answer

1. Use this data set.

    14, 4, 7, 3, 12, 6, 15, 9, 11

    Draw a box-and-whisker plot for the data set.

2. Use this data set.

    12, 5, 0, 16, 7, 8

    Draw a box-and-whisker plot for the data set.

3. The number of grams of protein a person consumes each day is shown. Construct a box plot to display the data. Explain your process.

55, 60, 72, 54, 52, 58, 61, 60, 58, 56, 55, 64, 53, 53, 57
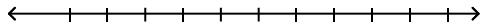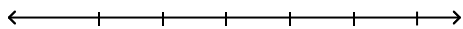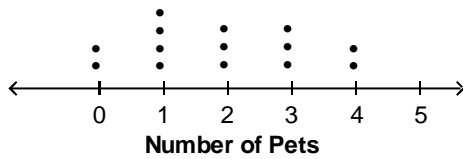
←———+—+—+—+—+—+—+—+—+—+→

4. Bill asks his classmates the question, "How many pets do you have?" The data he collects is shown. Using this data, he constructs the dot plot shown. Is Bill's dot plot correct? If so, explain. If not, identify his mistake and construct the correct dot plot.
1, 0, 3, 1, 4, 0, 2, 1, 0, 3, 2, 4, 1, 2, 0, 2, 3, 1

←———+—+—+—+—+—+—+→

Problem

1. Jennifer is having her annual party next week. The number of people that have attended her last 12 parties is shown.
20, 19, 16, 22, 24, 18, 17, 22, 19, 22, 18, 18

   a. Explain how to find the median of the data set.
   b. Explain how to find the upper and lower quartiles of the data set.
   c. Use parts a and b to display the data using a box plot.

   ←—+—+—+—+—+—+—+—+—+—+→
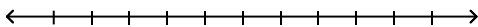
   d. What is the interquartile range of the data?

2. Jamie asks his classmates how many hours of television they watch daily. This data is shown.
2, 6, 4, 1, 0, 3, 6, 2, 3, 5, 3, 1, 6, 0, 4, 6, 2, 7, 2, 2, 5

   a. Use a dot plot to display the data.

   ←+—+—+—+—+—+—+—+—+—+—+—+→
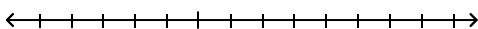
b. Use a histogram with four equally sized intervals to display the data.

c. Compare the shape of your graph from part a with the shape of your graph from part b. Explain why the shapes are different

Answer Section

MULTIPLE CHOICE

1. ANS: A   PTS: 1   NAT: NT.CCSS.MTH.10.6.6.SP.4
   DOK: DOK 1

2. ANS: B   PTS: 1   NAT: NT.CCSS.MTH.10.6.6.SP.4
   KEY: box-and-whisker plot   DOK: DOK 2

3. ANS: D   PTS: 1   NAT: NT.CCSS.MTH.10.6.6.SP.4
   DOK: DOK 3

4. ANS: C
   The value of the upper quartile is the value where the box ends. So, the value of the upper quartile is 36.

	Feedback
A	This is the value of the lower quartile.
B	This is the value of the median.
C	That's correct!
D	This is the greatest value.

   PTS: 1   NAT: NT.CCSS.MTH.10.6.6.SP.4   KEY: box plot | graphing data
   DOK: DOK 1

SHORT ANSWER

1. ANS:
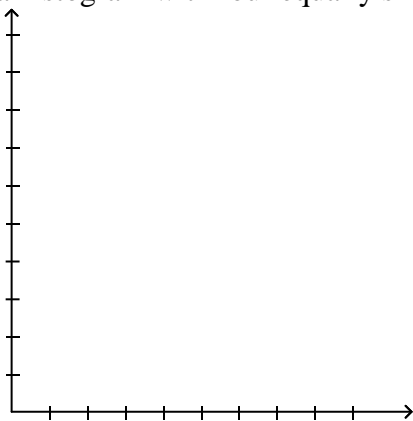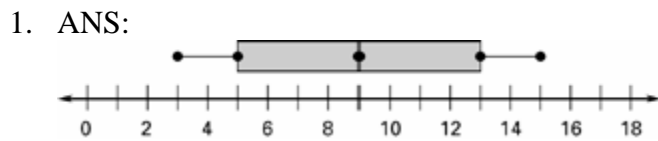

   PTS: 1   NAT: NT.CCSS.MTH.10.6.6.SP.4   KEY: box-and-whisker plot
   DOK: DOK 2

2. ANS:
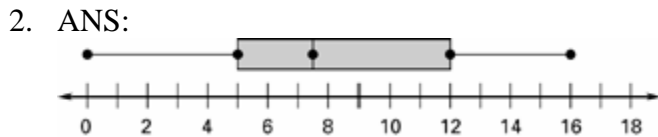
   PTS: 1   NAT: NT.CCSS.MTH.10.6.6.SP.4   KEY: box-and-whisker plot
   DOK: DOK 2

3. ANS:

First, put the values in order from least to greatest.
52, 53, 53, 54, 55, 55, 56, 57, 58, 58, 60, 60, 61, 64, 72

Next, find the least value, greatest value, and median of the data set.
Least value: 52 grams
Greatest value: 72 grams
Median: 57 grams

Finally, find the upper and lower quartiles. The upper quartile is the median of the upper half of the data: 60 grams. The lower quartile is the median of the lower half of the data: 54 grams.

48   54   60   66   72   78
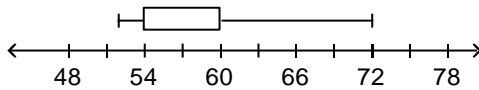
Rubric
2 points for graph; 2 points for explanation

PTS: 4   NAT: NT.CCSS.MTH.10.6.6.SP.4 | NT.CCSS.MTH.10.K-12.MP.3
KEY: box plot | graphing data   DOK: DOK 2

4. ANS:
No; There should be 4 dots for 0 pets, 5 dots for 1 pet, and 4 dots for 2 pets. The number of dots for 3 and 4 pets is correct.

0   1   2   3   4   5
Number of Pets
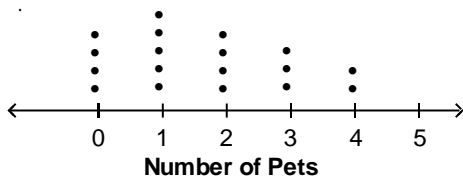
Rubric
1 point identifying mistake; 2 points for correct graph

PTS: 3   NAT: NT.CCSS.MTH.10.6.6.SP.4 | NT.CCSS.MTH.10.K-12.MP.3
KEY: dot plot | error analysis | graphing data   DOK: DOK 2

PROBLEM

1. ANS:
   a. The median is the middle value in the data set.
      First, order the values from least to greatest.
      16, 17, 18, 18, 18, 19, 19, 20, 22, 22, 22, 24

      Since there are two middle values, the median is the average of the 2: $\frac{19+19}{2} = 19$ people.

b. The upper quartile is the median of the upper half of the data. The upper half of the data is 19, 20, 22, 22, 22, 24. The median of this half is $\frac{22+22}{2} = 22$ people.

The lower quartile is the median of the lower half of the data. The lower half of the data is 16, 17, 18, 18, 18, 19. The median of this half is $\frac{18+18}{2} = 18$ people.

c.
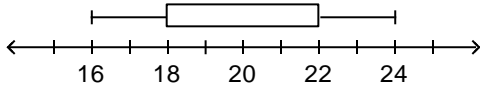
d. The interquartile range is $22 - 18 = 4$ people.

Rubric
a. 1 point
b. 1 point
c. 2 points
d. 1 point for interquartile range

PTS: 5
NAT: NT.CCSS.MTH.10.6.6.SP.4 | NT.CCSS.MTH.10.6.6.SP.3 | NT.CCSS.MTH.10.K-12.MP.3
KEY: box plot | graphing data | interquartile range | median   DOK: DOK 2

2. ANS:
a.
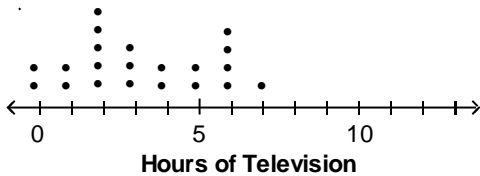
b.
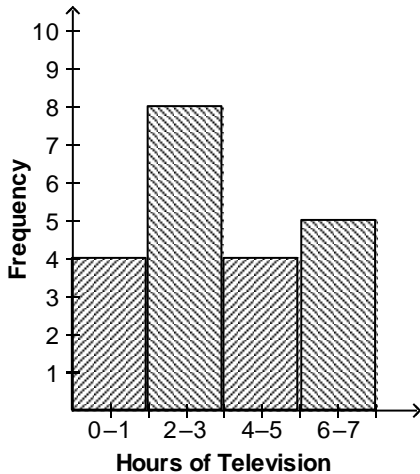
c. Possible answer:

The dot plot displays the frequency of every value in the data set and the histogram groups the values into four equally sized intervals and displays the frequency of each interval. The dot plot shows there are peaks at 2 hours and 6 hours while the histogram shows there is a peak for the 2 to 3 hours interval.

Rubric
a. 2 points
b. 2 points
c. 1 point for comparison; 1 point for explanation

PTS: 6
NAT: NT.CCSS.MTH.10.6.6.SP.4 | NT.CCSS.MTH.10.6.6.SP.2 | NT.CCSS.MTH.10.K-12.MP.3
KEY: histogram | dot plot | graphing data   DOK: DOK 2

Appendix B

Multiple Choice

Identify the choice that best completes the statement or answers the question.

_____ 1. Dr. Furh measures the length and mass of a hamster. Which units is she most likely to use?
   a. mm, g   c. m, kg
   b. m, g   d. mm, kg

_____ 2. Colleen is training over the summer for a triathlon. The amount of time that she spends training daily is displayed on the dot plot shown. How many days did Colleen spend training?

Number of Hours

   a. 7
   b. 8
   c. 15
   d. The number of days cannot be determined.

_____ 3. The dot plot shown displays the heights, in inches, of the students in one class. Which measure of variability best describes how spread out the heights of the students are?

Height (inches)

   a. Mean
   b. Median
   c. Mean absolute deviation
   d. Interquartile range

Numeric Response

1. The data set shows the number of participants at a fundraiser and the amount of funds raised. Use a graphing calculator to find the least-squares line for the data with number of participants as the independent variable. Then calculate the mean absolute deviation. Round your answer to the nearest hundredth..

Family House Fundraiser

Number of participants	10	15	20	25	13	15
Funds raised ($)	550	470	550	650	600	600

2. The table lists Chang's scores in five games of bowling. Find Chang's score for the sixth game if his mean score for all six games was 149.

Game	1	2	3	4	5	6
Score	148	145	159	158	158	?

3. John's last six golf scores were 77, 82, 85, 76, 86, and 77. The best of the golf scores is always the lowest score. A news reporter asked for his average golf score. John chose to use the average that makes his golf scores seem as good as possible. Find the value, mean, median, or mode, that John reported.

4. Patrick's math test scores were 65, 65, 67, 69, 69, 88, 89, 89, and 92. Find the value, the mean or median, that is a better indicator of how well Patrick is doing in class.

Matching

Using the data set shown, match the measures of center and spread with their corresponding values. Round answers to the nearest tenth as needed.
3, 7, 9, 2, 11, 6, 13, 12, 15, 9, 3, 6, 13, 9, 10, 5
a. 3.3
b. 6.0
c. 7.0
d. 8.3
e. 9.0
f. 12.0
g. 13.0

____   1. Mode

Short Answer

1. The list shows the number of gold, silver, and bronze medals won by countries in a recent Winter Olympics.

   1, 1, 2, 3, 3, 5, 5, 5, 6, 6, 7, 7, 8, 10, 15, 25, 29

   Part A: Construct a dot plot of the data.
   Part B: How many countries won at least 6 medals?
   Part C: What is the most common number of medals won?
   Part D: Did one or more of the countries win a number of medals that seems unusual compared with the other countries? If so, what is the number or numbers?

2. Luis collected the following data to see how many points he scored in basketball games this season.

Points Scored											
5	1	3	8	6	3	11	12	10	15	10	12

   How many games did Luis play in?

Answer Section

MULTIPLE CHOICE

1. ANS: A   PTS: 1   NAT: NT.CCSS.MTH.10.6.6.SP.5.b
   KEY: data attribute   DOK: DOK 2

2. ANS: C
   The number of days Colleen spends training is the number of observations in the data set. The number of observations in a data set displayed on a dot plot is the number of dots there are. The number of observations in the data set shown is 15. So, Colleen spends 15 days training.

	Feedback
A	The number of days Colleen spends training is not the number of different hours she spends training each day.
B	The number of days Colleen spends training is not the largest number of hours she spends training.
C	That's correct!
D	The number of days Colleen spends training is equal to the number of observations in the dot plot.

   PTS: 1   NAT: NT.CCSS.MTH.10.6.6.SP.5.a
   KEY: number of observations | box plot | summary of data set   DOK: DOK 1

3. ANS: C
   The overall shape of the distribution of the data set is roughly symmetric. So, the mean absolute deviation best describes the variability of the heights.

	Feedback
A	The mean is a measure of center, not variability.
B	The median is a measure of center, not variability.
C	That's correct!
D	Think about what the overall shape of the distribution is and how it affects the values of the measures of variability.

   PTS: 1   NAT: NT.CCSS.MTH.10.6.6.SP.5.d
   KEY: mean absolute deviation | measure of variability | summary of data
   DOK: DOK 1

NUMERIC RESPONSE

1. ANS: 44.02

PTS: 1 REF: fa136d67-6ff9-11df-9c81-001185f0d2ea
NAT: NT.CCSS.MTH.10.6.6.SP.5.c
KEY: residual | linear | least-squares | regression | absolute | deviation | goodness | of | fit
DOK: DOK 2

2. ANS: 126

PTS: 1 REF: 909d0837-9631-11dd-8a40-001185f11039
NAT: NT.CCSS.MTH.10.6.6.SP.5.c STA: NC.NCES.MTH.09.6.6.S.3.2
LOC: MTH.C.13.04.02.01.01.001 TOP: Additional Data and Outliers
DOK: DOK 2

3. ANS: 77

PTS: 1 REF: MCT60444
NAT: NT.CCSS.MTH.10.6.6.SP.5.c | NT.CCSS.MTH.10.6.6.SP.5.d
STA: NC.NCES.MTH.09.6.6.S.3.2 | NC.NCES.MTH.09.6.6.S.3.3
LOC: NCTM 6-8.PRS.2 | NCTM 6-8.NOP.1.c | NCTM 6-8.REP.3 | NCTM 6-8.DAP.2.a |
NCTM 6-8.CON.3 | NCTM 6-8.PRS.1 TOP: Misleading Statistics KEY: mean |
median | average | mode
DOK: DOK 2

4. ANS: 77

PTS: 1 REF: MCT70547
NAT: NT.CCSS.MTH.10.6.6.SP.3 | NT.CCSS.MTH.10.6.6.SP.5.d
STA: NC.NCES.MTH.09.7.7.S.2.2 | NC.NCES.MTH.09.7.7.S.3.2
LOC: NCTM 6-8.DAP.2.a TOP: Mean, Median, and Mode
KEY: table | mean | spreadsheet | median | choose DOK: DOK 2

MATCHING

1. ANS: E PTS: 1 NAT: NT.CCSS.MTH.10.6.6.SP.5.c
KEY: mean | median | mode | range | mean | interquartile range | measure of spread | measure of
center | summary of data DOK: DOK 1

SHORT ANSWER

1. ANS:
Part A:
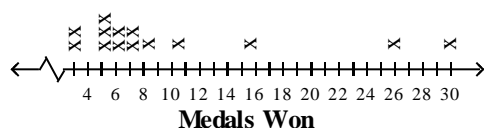
Medals Won

Part B: 9 countries
Part C: 5 medals
Part D: Sample answer: Yes; 15, 25, and 29 medals are unusual, because they are significantly greater than the other numbers of medals won.

PTS: 1   NAT: NT.CCSS.MTH.10.6.6.SP.5 | NT.CCSS.MTH.10.6.6.SP.4
KEY: summarizing data   DOK: DOK 3

2. ANS:
    12 games

    PTS: 1   NAT: NT.CCSS.MTH.10.6.6.SP.5.a   DOK: DOK 1

References

Cook, Ph.D. Kim (Course Lecturer). (2017). Mathematical Structure Module 1: Overview:

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