NCLB Math Institute Summer 2011
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School: Ruleville Central Elementary School (Ruleville, MS)
Grade Level: 5th Grade
Box and Whisker Plot and Stem and Leaf

1) Teaching Objective (s):

- The student will collect, organize and construct a box and whisker plot.
- The students will construct and analyze a stem and leaf plot.

2) Instructional activities

1. Explain to the students that a box and whisker plot is useful when working with a large set of data.

2. Remind students that in a box and whisker plot, we focus on 5 main values. Write the following on the board:

- Median- the middle of all of the set of data.
- Lower Extreme- the lowest/smallest value in the set of data
- Upper Extreme- the highest/largest value in the set of data
- Lower Quartile- the median of the lower half of the set of data
- Upper Quartile- the median of the upper half of the set of data

3. Tell students, today we are going to use our heights in order to construct a box and whisker plot.

4. Pass out index cards and ask students to write down their height in centimeters. Instruct students to separate the one place value from the tens digit. (Example; 123= 12 3 will use in stem and leaf plots) Point out the chart on the wall with a ruler drawn out to help the student with measuring their height. Allow 10-15 minutes for students to measure their selves and write it on the index cards. Have students return to their seat once they have been measured.

5. Now have students compare their height in centimeters with the class by comparing their numbers to determine who has the smallest or largest number. Then allow them time to line up around the room in order from the shortest to the tallest. Once the students are in order remind students how to pick out the median of the data set.

6. Give the student who represents the median the green flag. Then have the students pick out the extremes. Reminding students how to recognize them. Give each of the students that represent the extremes a red flag.

7. After finding the extremes, focus on finding the quartiles (lower and upper); give those two students a blue flag.

8. Instruct any student that is the same height to line up behind each other. Then all but one returns to their seat.

9. Place a piece of construction paper on the floor for heights not represented by a student. (Example: if you have a student who is 138 cm and one that is 140 cm, you need to place a piece of construction paper on the floor for 139cm).

10. Explain that in a box and whisker plot the box runs from quartile to quartile. Have students who have the quartile flags raise them high. Start rolling out the typing paper roll, beginning at the lower quartile and ending at the upper quartile. Student should hold the paper.

11. Have students locate the median of the set of data. Remind students that it should be located inside the box, but not necessarily in the middle   Median Student should stand in place.

12. Now explain that the whiskers run from quartile to extreme on the upper and lower ends.

13. Then unroll the adding machine tape from the quartile to the extreme on each end. Students should tape whiskers in place.

14. All students except the extremes, quartiles and median can return to their seat. This lets the class see the box and whisker plot. Now using painters tape attach the box and whisker plot to the wall.

15. Have a volunteer share what they have learned about the box and whisker plot.

16. Now tell the students that we are going to use the same data to construct a stem-and-leaf plot.

17. Display chart with stem and leaf outline on it .(See Attachment #1) Explain to the students that the stem and leaf plot helps you to see how data can be clustered or grouped.

18. In a stem and leaf plot, we groups the data by the tens digit Then order the data from the least to the greatest. Give the following example (78, 79, 81, and 103).

Stem	leaves
7	8, 9
8	1
9	
10	3

19. Have students compare their height cards from previous lesson to see what numbers need to be under the stem part of our stem and leaf plot. When students have determined where their card should be placed have them cut the ones digit from the remaining number and place only the ones digit under the leaves.

20. Compare the data from the stem and leaf plot with the box and whisker plot. Have the students' identity the median, extremes and the quartiles in the stem and leaf plot and compare it to the box and whisker.

Materials/Resources:

- Height of students in class in centimeters
- Index cards
- Construction paper
- 2 rolls of adding machine tape
- Strip of bulletin board paper about one foot wide and 20 feet long
- Flags (2 red, 2 blue, 1 green)
- Large open area

Assessment:

Teacher observations: Students will be given an addition set of data. (Attachment # 2) They should identify the extremes, quartiles, and median of each set. A rubric will be used to assess student understanding. (Attachment #3)

Attachment #1
Stem and Leaf Outline

Stem   Leaves

Sample of stem and leaf plot

Stem	leaves
7	8, 9
8	1
9	
10	3