This learning progression is writing for a 11th and 12th grade Statistic class. In this classroom there is no math textbook but Khan Academy is used. Khan Academy is used to help the students review lessons that they need more help understanding. If a student does not understand the lesson the student will be able to watch Khan Academy video to help them understand the lesson. On the teacher website the links to the Khan Academy video that link up to the lesson will be posted. The purpose of this is to help students who had hard time learning in the classroom and/or need extra help. The standards for this classroom will be using CCSS are HSS.ID.A.1, HSS.ID.A.2, and HSS. ID. A.3. The CCSS- mathematical practices that are used in this learning progression are; MP4: Model with mathematics, MP6: Attend to precision, MP7: Look for and make use of structure.

 This learning progression will be used at the beginning of the year to get students a first taste of statistic. In the learning progression, students will be learning how to make box and whisker plots. Once the students understand box and whisker plots (after this learning progression), the teacher will use box and whisker plots to graph student’s scores on tests and other assessment. This way student will be using this information and will help students remember these lessons. There will be three lessons to happen in this learning progression.

 For teaching strategy for this learning progression the teacher will make the worksheet so that the students have personal connect to them. The teacher will collect data in the first lesson that will be used in future worksheets. According to Jill Davidson “when mathematics students and teachers are able to deepen their relationships with the curriculum and with each other, they are more likely to teach and learn in ways that promote sustained, connected, meaningful understanding.” This is the reason behind why the teacher is using this teaching strategy to teach there class. The more meaningful the data is the more willing the students will understand the contact.

Lesson 1

[Khan Academy link for lesson 1](https://www.khanacademy.org/math/probability/descriptive-statistics/central_tendency/e/mean_median_and_mode)

In lesson 1, students will be learning about mean, median, mode, and range. At the start of class, there will be some question on the white board that students will need to answer. Such as how many pets to do you have? This questions answer will be used to make lesson 2 worksheet which is about box and whisker plots. Once the students are

done with this warm up, The teacher will define the mean, median, mode and range. The teacher will make the connect that mean is the same as average because average is not a new term for the students. Giving the students a great definition will help the student will their mathematical precisionMP6. The teacher will also teach the students the equation for finding the mean, median, mode, and range. To do this the teacher will pick a question from the warm up and write all the data down. Next the teacher would put the data in order from least to greatest and teach the students how to find the mean, median, mode and range. Doing this example will help keep students engaged in this lesson because the data set comes from them. Once I

HSS.ID.A.2: Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

MP6: Attend to precision

am done teaching the students and doing a example there will be a worksheet with four problems. The problems on the worksheet will be data set and students will need to find the mean, median, mode, and range. Once the students are done with the worksheet, the teacher will give them an exit slip which is the benchmark assignment. The benchmark assignment will help the teacher see if the students can more on or not.

Lesson 2

[Khan Academy link for lesson 2](https://www.khanacademy.org/math/probability/descriptive-statistics/box-and-whisker-plots/v/reading-box-and-whisker-plots)

In lesson 2, students will learn how to make a box and whisker plot. For the warm up I will give the student a new

problem that they have never done before. The problem will be about finding the minimum grade a student must get on the last test in order to achieve the average the student want? The problem will help student with their problem-solving skills. Once the warm up is done the teacher will teach the lesson about how to make a box and whisker plot. The teacher will use another one of the data set that the students made in lesson 1 warm-up. Doing this example will help keep students engaged in this lesson because the data set comes from them. The teacher will go step by step

Benchmark: Find the mean, median, mode, and range for the following list of values:

13, 18, 13, 14, 13, 16, 14, 21, 13. What does the mean median, mode, and range mean?

HSS.ID.A.1:Represent data with plots on the real number line (dot plots, histograms, and box plots).

to make a box and whisker plot. These students will be able to understand each step and why it is important. Once the

box and whisker plot is done students will be able to make their own box and whisker plotsMP4. After the lesson is taught the teacher will hand out a worksheet. On this worksheet there will be four different data set students will need to make into box and whisker plot. Each of the data set will be from the data gather form the warm up in lesson 1. Which will help engaged students in the lesson. Once the students are done with the worksheet, the teacher will give them an exit slip which is the benchmark assignment. The benchmark assignment will help the teacher see if the students can more on or not.

Lesson 3

[Khan Academy link for lesson 3](https://www.khanacademy.org/math/probability/descriptive-statistics/box-and-whisker-plots/v/reading-box-and-whisker-plots)

In lesson 3 students will learn about outliers in data set. For the warm up students will need to do a box and whisker plot with an outlier. This problem will be the same a problem from lesson 2 worksheet but there is one more data points. After the students do the warm- up I will ask them if there is anything weird about their box and whisker plot. The students should notice that this look different then the problem they did in lesson 2 worksheet. Once the student

MP4: Model with mathematics

Benchmark: Draw a box-and-whisker plot for the following data set:

4.3, 5.1, 3.9, 4.5, 4.4, 4.9, 5.0, 4.7, 4.1, 4.6, 4.4, 4.3, 4.8, 4.4, 4.2, 4.5, 4.4,10.5

Is there anything weird about this box and whisker plot?

HSS. ID. A.3: Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

tell me the different we will move on to the lesson. I will teach student about the different between data set that have no outliers and data set that have outliersMP7. Once the lesson is over students will be given a worksheet. On this worksheet they data set will be the same data set as lesson 2 worksheet but has outliers. Which will help engaged students in the lesson. Once the students are done with the worksheet, the teacher will give them an exit slip which is the benchmark assignment. The benchmark assignment will help the teacher see if the students can more on or not.

MP7: Look for and make use of structure.

Benchmark: Make a box and whisker plot of the data set. If there is an outliers make a box and whisker plot for the data set with an outliers and a box and whisker plot with no outliers.

10.2, 14.1, 14.4. 14.4, 14.4, 14.5, 14.5, 14.6, 14.7,

14.7, 14.7, 14.9, 15.1, 15.9, 16.4