Lesson Plan

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Box Plot & Experiments

By: Amanda Martin
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Math
Grades 9–12

Introduction

Students will discover how to make sense of data by learning the uses of a box plot. Students will additionally create box plots using data sets and analyze them for similarities and differences. From there, students will compare the data of two treatments from scientific experiments.

Learning Objectives

Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. (Common Core State Standards: MATH.CONTENT.HSS.IC.B.5)

Materials Needed

- Notebooks/journals/notebook paper

Procedure

1. Introduce box plots. Here is a helpful, short video that details information about box plots to assist student learning.
2. To better understand box plots, create a classroom survey to gather a simple data set. Display the following line plot on the board. Have students come up one at a time and mark their birthdate with an "X." Once all students have done this, walk students through the steps of identifying the box plot data as outlined in the video. Construct the box plot for student birthday data on the board.
3. Now that students understand the basics of box plots, they must use that knowledge to create box plots and interpret new data. Students will be given data from experimental treatments (two examples are given below). Students should work in small groups to analyze the data and make connections, find differences, and make inferences. Groups may analyze as many data sets as necessary to provide adequate practice with box plots and data. Be sure to stop groups periodically to discuss findings as a class before moving on to a new data set. Model how to effectively analyze the data from the box plot.
4. To close the lesson, students should create their own data set based on a made-up experiment involving two treatments on a piece of notebook paper. Then, students should create a box plot for the data. After completing the box plot, students must make a written statement explaining the data.

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Data Examples:

Data Set #1: In this example, rabbits were studied to determine the amount of weight gained while eating a particular diet over the course of 2 weeks. Half of the rabbits ate only plants while the other rabbits ate only meat.

Data Set #2: For this study, 16 epileptic patients were divided and given either a placebo treatment or medication to lower the number of seizures they experience on a daily basis.

Evaluation

Students will create a set of data that is to be used in a box plot. Students must additionally explain the data represented in the box plot. Please use the following rubric to assess student learning:

Student Name:	100%	75%	50% or less
Student data represents two treatments in an experiment.			
Student correctly identifies all components of the box plot.			
Students explains the data correctly.			