

# Histograms

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## Overview

This lesson is the second lesson in a unit on data analysis for online sixth grade math students. The first lesson in the unit is on dot plots and dot plots are used to build into this lesson on histograms. In this lesson, students explore the connections between dot plots and histograms, learn about the differences between the more well-known bar graphs and histograms, and discover how to analyze histograms.

## Description

**Topic:** Histograms

**Content Area:** Mathematics

**Grade Level:** 6<sup>th</sup> grade

**Duration:** 1 hour

## Objectives

- Students will be able to draw a histogram given a table of data.
- Students will be able to interpret data displayed in a histogram.

## Activities

This online lesson is presented over multiple pages in a linear fashion. The activities and information provided on each lesson page is described below.

## Page 1: Lesson Introduction

- **Learning Targets:** The objectives for the lesson are displayed in student-friendly language.
- **Lesson Introduction:** A short introduction video is displayed next to the learning targets, which provides an overview of the lesson, the topics students are expected to learn, and the importance of the topic for the students.
- **Lesson Directions:** Directions about how the lesson should be completed, and interactive features of the lesson are described in a tab.
- **Lesson Standards:** In a second tab that must be clicked on for the content to be displayed, the Pennsylvania and Common Core standards that relate to the lesson are provided.

## Page 2: Lesson Activity 1

- **Connection to Previous Lesson:** In the very first lesson activity, students use what they learned in the previous lesson on dot plots to make connections to the new idea of histograms.
  - Students encounter a dot plot displaying the weight, in pounds, of dogs at a dog show and are asked a question about the dot plot. Students may check their work and receive feedback if they do not remember how to answer the question from the previous lesson.
  - An image of a histogram is provided next with the description that it displays the same information as the dot plot.
  - Text descriptions provide more information about the histogram and are followed by questions for students to check their understanding. Students may check these questions and receive feedback.
- **Concept Check:** A video is provided that connects what students have likely already experienced, a bar graph, with histograms, and explains the key content for the histograms lesson. The video includes:
  - Visuals and descriptions of how histograms and bar graphs are similar and different.
  - The steps for creating a histogram from a set of data along with an example.
  - An interpretation of the histogram that was created.The key takeaways about histograms are provided in a bulleted list below the video.
- **Application:** A dot plot and histogram are displayed showing the population of states in the United States, in millions. Students are instructed to use both the dot plot and histogram to

help them answer the questions that follow based on what they have learned so far in the lesson. Students can check their answers and receive feedback on their responses. A statement at the end of this application sums up the key take away from interpreting this dot plot and histogram.

## Page 3: Lesson Activity 2

- **Creating a Histogram:** Students are led through a three-step process to create a histogram. This process is based on the instructions and example given in the video on the previous lesson page.
  - **Step 1:** Instructions are given about selecting an appropriate bin size based on the data given. Students select an appropriate bin size.
  - **Step 2:** Instructions are given about how to create a table for the data based on the bin size selected. A table is given with some values missing for students to fill in.
  - **Step 3:** Instructions are given about how to draw the histogram from the table. A whiteboard is provided for students to practice drawing the histogram.

When students finish the three steps, they may click a button that displays the correct histogram so they can check their work. They may also click a different button to check their answers to steps 1 and 2 and receive feedback.

- **Interpretation:** Students are asked a question that requires them to interpret the histogram they just created. They may use the correct histogram that was provided for interpretation. Once students answer the question, they can click a button to check their answer and receive feedback.

## Page 4: Lesson Summary and Cool Down

- **Summary:** A summary of the key takeaways and objectives from the lesson is provided with text and images. The images include dot plots and histograms.
- **Glossary Term:** The definition of a histogram with an image of a histogram is provided for students.
- **Cool Down:** An interpretation question with a histogram provided is given to the students. This is the standard type of question they can expect to encounter on the following quiz. After selecting their answers, students may check the correctness of their answers and receive feedback.

## Materials

- Computer or tablet with internet access
- Browser, such as Chrome, installed on the computer or tablet
- If using a computer, an external mouse or drawing pad is recommended for the drawing portion of the lesson

## Evaluation

Students receive full credit upon submission of the lesson. Even though they receive full credit based on completion, students and teachers can see which questions were answered correctly and incorrectly. After the lesson, students take a quiz involving both computer-graded and open-ended questions based on the objectives of the lesson. In the quiz, students need to draw a histogram given a table of data and interpret data that is displayed in histograms.