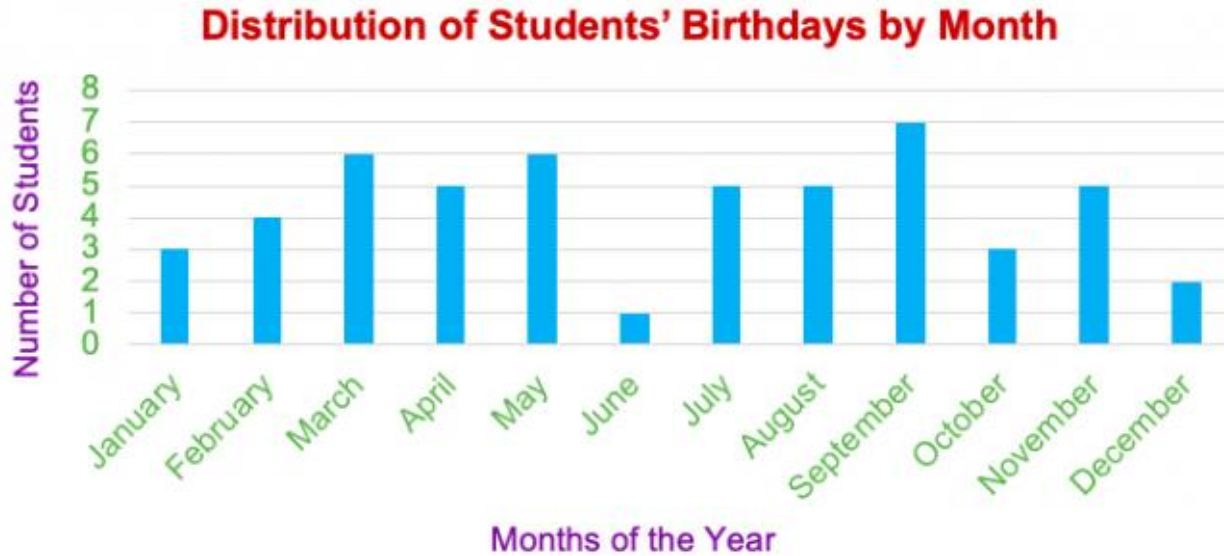


How to Read and Interpret Statistical Graphs

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Statistical graphs allow data to be presented in a variety of visual formats. In this lesson, you will learn how to identify the major components of a statistical graph and how to interpret the data that appear in a statistical graph.

There are four major components of a graph, each of which is color-coded on the graph below.

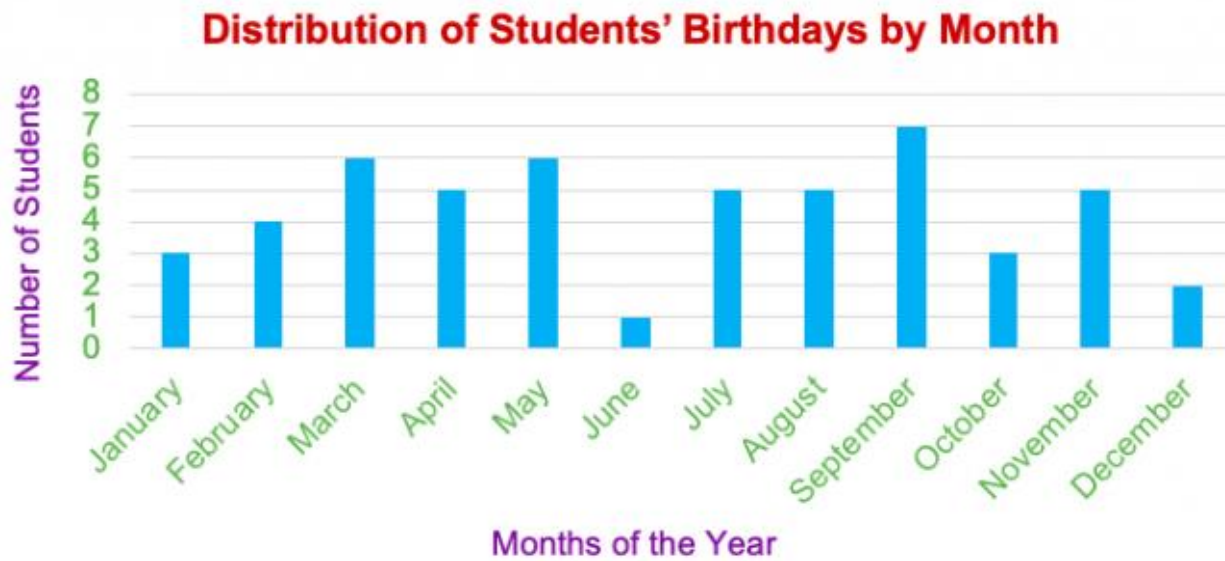


The first component is the **Graph Title**, which tells you what the graph is about. In the graph above, the **Graph Title**, is **Distribution of Student's Birthdays by Month**. This **Graph Title** tells you the graph will display data on students' birthdays during each month of the year.

The second component are the **Axis Labels**. On a standard graph, there are two axes: the x-axis, which goes left to right horizontally, and the y-axis, which goes up and down vertically. An easy way to remember which is the x- versus y-axis is the saying "x to the left, and y to the sky"!

In the graph above, the x-**Axis Label** is **Months of the Year**, and the y-**Axis Label** is **Number of Students**.

Here again is the same graph we've been talking about.



The third component are the **Graph Units**, which are the units of information presented on the two axes. These are typically numbers, such as the numbers **0** through **8**, or categories, such as months of the year (e.g., **January**, **February**, etc.), on the graph above. **Graph Units** quantify or classify the information being presented.

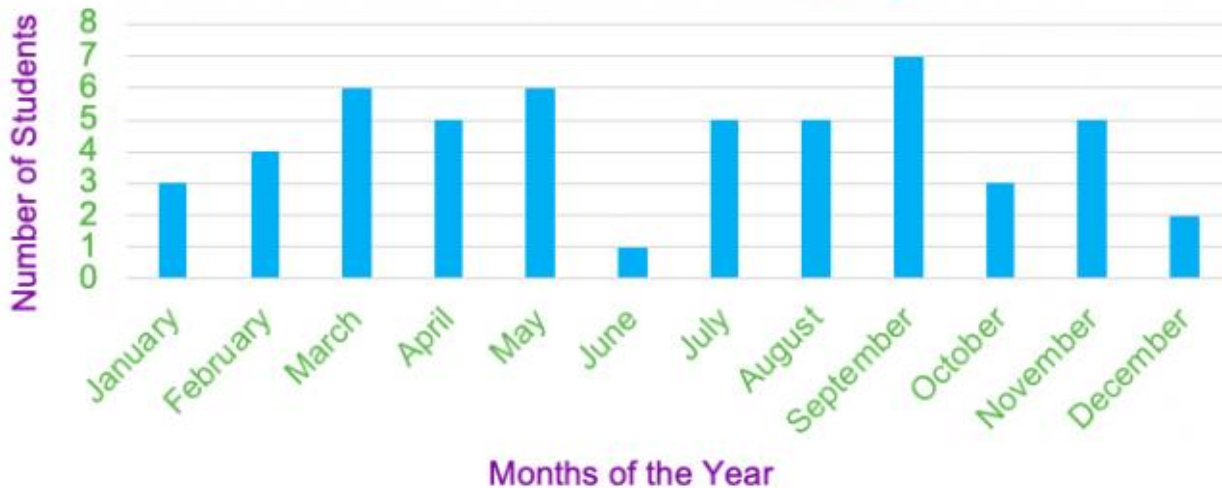
The fourth and last component of a graph are the **Graph Data**. **Graph Data** can be represented in many different forms, such as through bars, as in the graph above, or through dots, lines, or other representations. For example, in the above graph the **Graph Data** are bars that display the number of students who have birthdays in each month of the year.

You've now learned the four major components of a graph: the **Graph Title**, **Axis Labels**, **Graph Units**, and **Graph Data**.

Now that you know the four major components of every statistical graph, you can learn how to interpret statistical graphs.

Let's go back to our statistical graph displaying students' birthdays by month to better understand what the **Graph Data** mean.

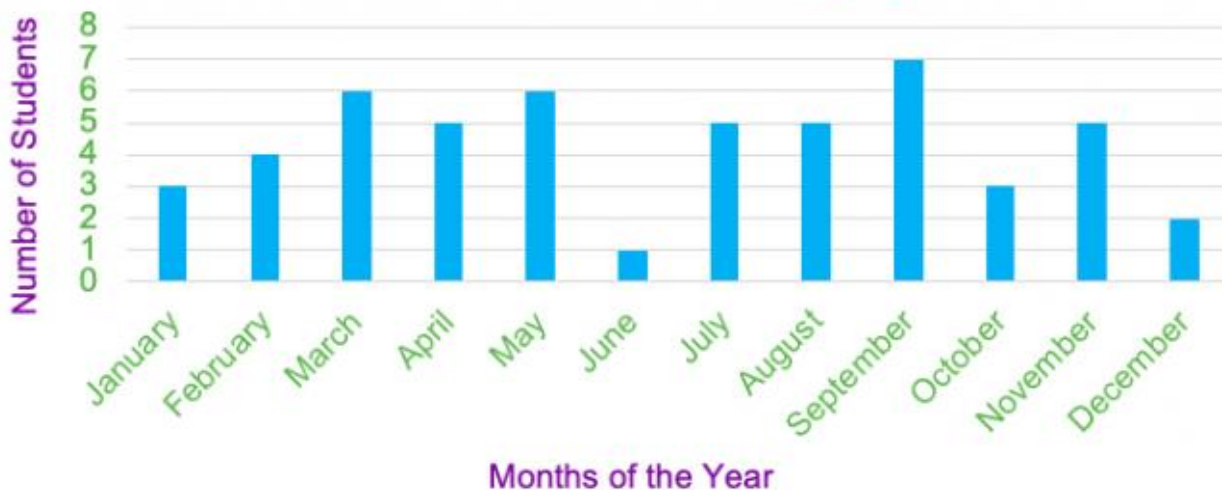
Distribution of Students' Birthdays by Month



For example, we can look at each month to see how many students have a birthday then. To do this we first need to locate the **Graph Units** on the x-axis, and then look at the bar that represents each unit. The height of the bars shows the number of students with birthdays in each month. In our graph, September is a popular birthday month, with 7 students having a birthday then – the most out of all of the months!

Beyond just learning how many students have birthdays in a given month, we can also learn how many students have birthdays in a given season of the year. For example, we can use the statistical graph to see how many students have birthdays during the summer months (June, July, August).

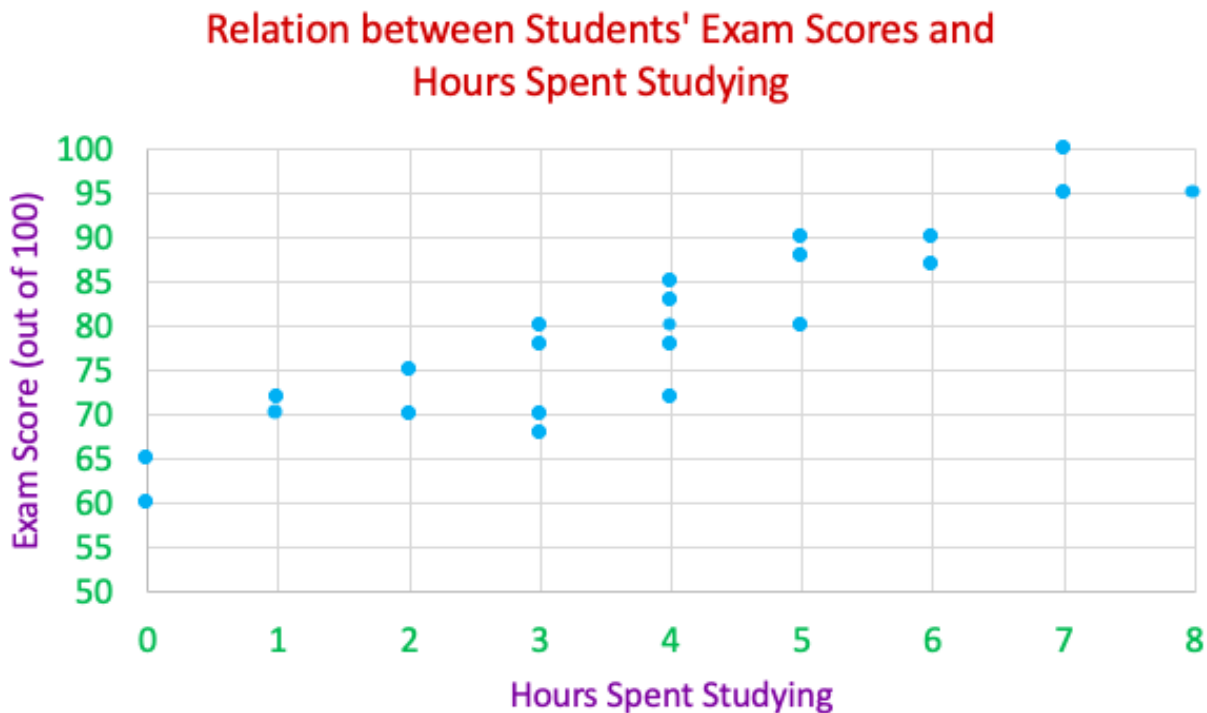
Distribution of Students' Birthdays by Month



Even though there is not a **Graph Unit** labeled "Summer," we can still learn this information from our statistical graph! To do this, we simply need to find the number of students who have birthdays in the month of June (one student), July (five students), and August (six students). Then, we add those numbers together and we see that 11 students have birthdays in the summer.

Now that you've learned how to interpret **Graph Data** from bar graphs, you can extend your knowledge to other types of statistical graphs, such as scatter plots.

Scatter plots tell us how two variables are related. For example, in the below graph, we can see that the y-**Axis Label** is **Exam Score (out of 100)**, and the x-**Axis Label** is **Hours Spent Studying**. Therefore, because this graph is a scatter plot, it will show us the relationship between those two variables, students' **Exam Score (out of 100)** and students' **Hours Spent Studying**.

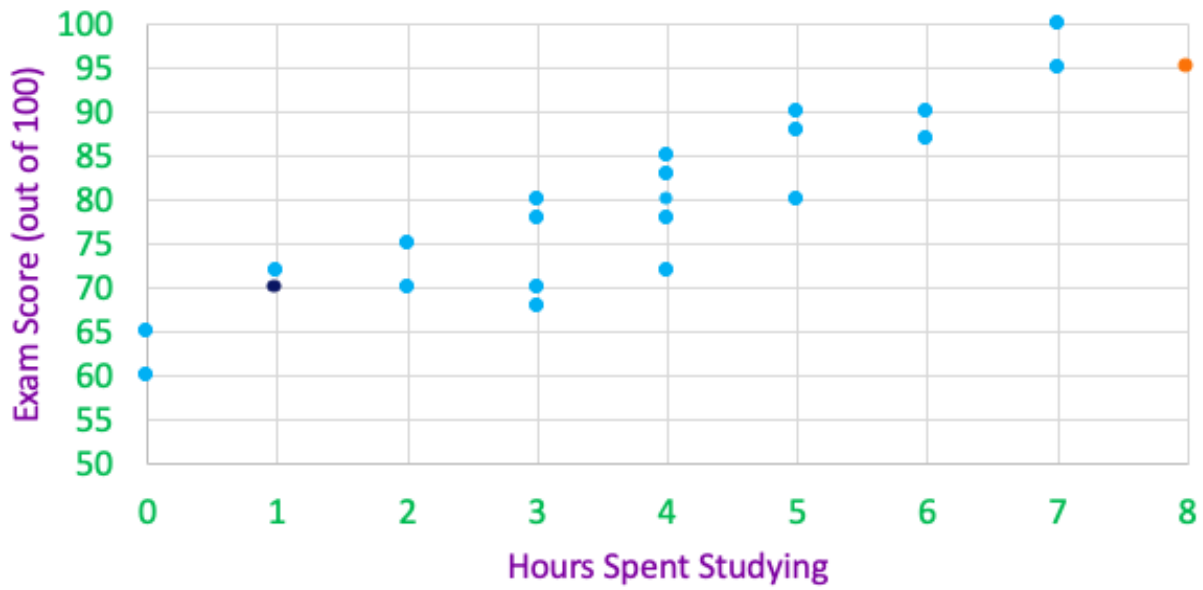


On a scatter plots, the **Graph Data** are dots, rather than bars (as in our previous examples). Each dot on a scatter graph represents an individual data point. For example, in the scatter plot shown above, each dot represents an individual student.

By using what you learned about reading x-**Axis Labels** and y-**Axis Labels**, you can easily read a scatter graph.

Below is the same scatter plot; however, we've marked two individual data points, one with orange and one with dark blue. In the scatter plot below, the student represented by the orange data point earned a 95 on their exam and spent 8 hours studying. The student represented by the dark blue data point earned a 70 on their exam and spent 1 hour studying.

Relation between Students' Exam Scores and Hours Spent Studying



You've now learned how to read and interpret statistical graphs!