

# Grade 6 Science Unit 1 Lesson 7

## Objective & Introduction

Today's lesson objective is:

**Students will collect and organize data to find patterns that support or refute a prediction.**

Are you an organized person or do you like when things are a little messy? Are you able to find things when you need them? When you are doing science experiments, it is important to be neat and organized so that you know where your data is when you need it. In this lesson, we are going to learn a few ways to keep your data organized and easy to read.



Take a moment and think about this objective.

What strategies do you think you will use when organizing the data that you've collected? Will you use the same strategies that you've used before? How do you think they will be different? Not only do you need to organize your data for yourself, you must present your data in ways that other scientists can replicate.

Open your digital notebook and describe some learning skills that you will use in this lesson.

## Organizing Data

When you work on science experiments, you will make observations that will eventually be considered data. Data can also be collected through measurements. Once the data is collected, you can organize it in a way that makes it easy to read. The simplest way to do this is to put the information into a data table. You can also use graphs and drawings to represent your data. Graphs and data tables help you to see trends and patterns in the data. No matter which method you use, it is important to make sure that your data is organized and readable so that you



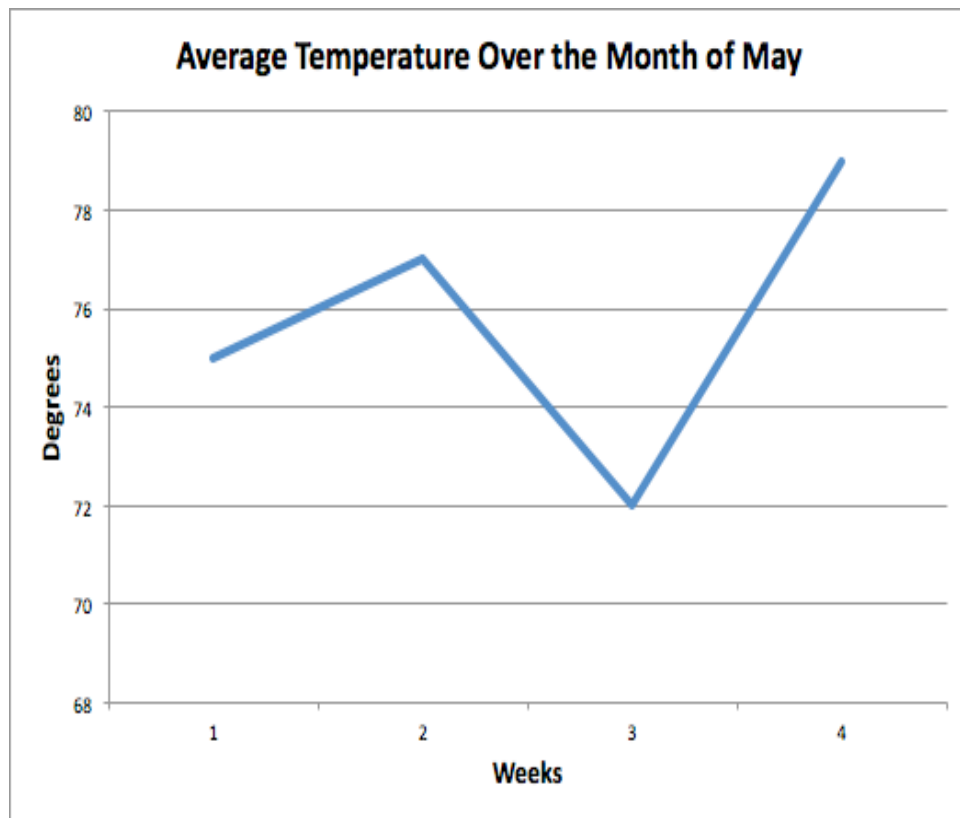
can use it to either confirm or contradict your hypothesis.

How do you know whether to use tables or graphs to show your data? When you are simply displaying the information you can put the data into a table, but if you want to show patterns or trends in the data, it is best to use a graph.

For example, if you want to show what the temperatures were for the month of May, you could place them in a table like the one below.

| <b>Week</b> | <b>Avg. Temp</b> |
|-------------|------------------|
| 1           | 74.6             |
| 2           | 77.2             |
| 3           | 72.1             |
| 4           | 79.4             |

However, if you want to show the pattern of temperature change throughout the month, you would use a graph.



Now you try a few.

Rafael writes with two pens to see how long they last. He writes the same word over and over until the pens run out of ink. He counts the number of words he gets out of each pen before it runs out. Which of the following is the variable being changed by the scientist (independent variable) in this experiment?

|   |                 |
|---|-----------------|
| A | Type of pen     |
| B | Number of words |
| C | Type of paper   |
| D | Words written   |

Rafael writes with two pens to see how long they last. He writes the same word over and over until the pens run out of ink. He counts the number of words he gets out of each pen before it runs out. Which of the following is the variable being changed by the scientist (independent variable) in this experiment?

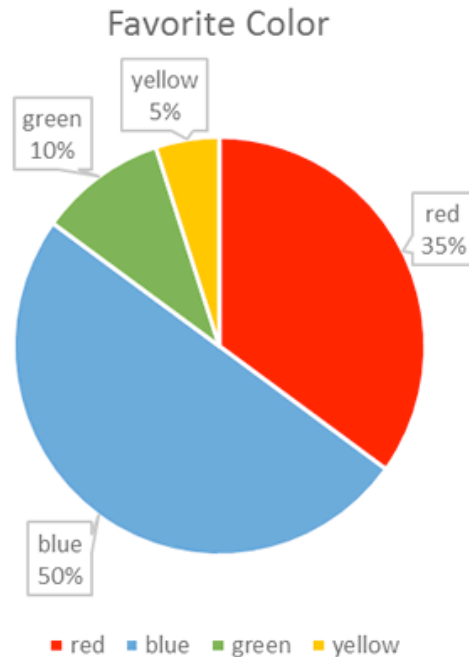
|   |                 |
|---|-----------------|
| A | Type of pen     |
| B | Number of words |
| C | Type of paper   |
| D | Words written   |

## Using Tables and Graphs

Once you have your data, you can organize it into a table or graph. A data table is a group of facts that are arranged in labeled rows and columns. Its purpose is to help sort, analyze, and compare the data you collected in your experiment. Once the data is placed in your table, you will have to graph it in order to see if it supports your hypothesis or to look for patterns. You can use bar graphs, line graphs, or pie charts.

When you are working with percentages, it is best to use a pie chart. A pie chart displays parts of a whole, or fractions.

Consider the following example. The pie chart shows the percentage of people that prefer each color.

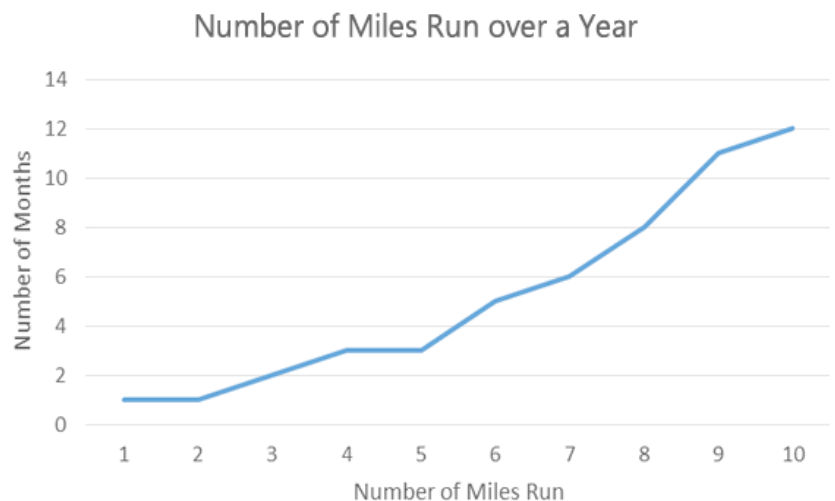


As you can see, 50% of the people prefer blue, 35% prefer red, 10% prefer green, and only 5% prefer yellow. Therefore, the majority of people prefer blue.

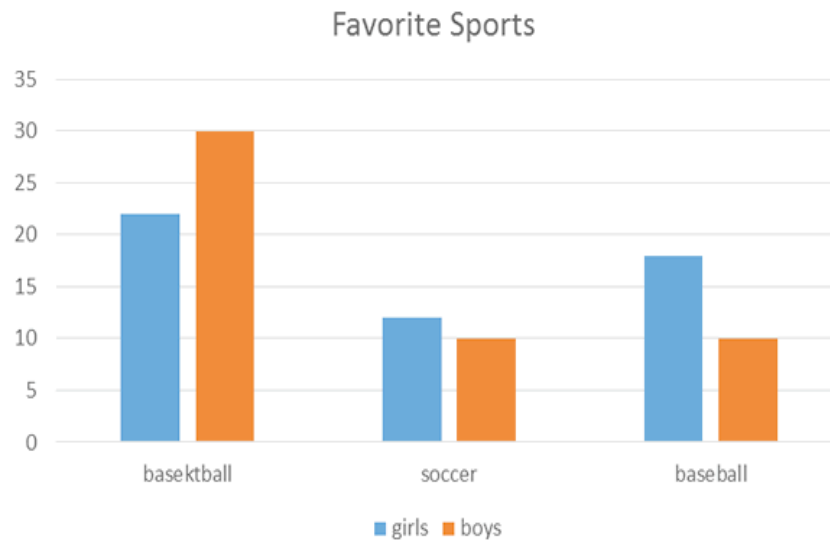
When you are measuring data over a period of time, you will use a line graph. Line graphs are very useful for predicting what may happen in the future. Line graphs are particularly useful for showing trends, such as positive, negative, or consistent. A positive trend is one in which the values increase, whereas a negative trend represents values that decrease. If change is consistent, that means the same kind of change continues to occur over a longer period of time.

In this line graph, we are looking at the number of miles someone ran over the course of one year.

The more months that went by, the more miles the runner was able to run.



Bar graphs are useful when you are comparing data. In the following example, 50 girls and 50 boys were asked about their favorite sports.



A bar graph makes it easy to see how many boys and how many girls liked each sport.

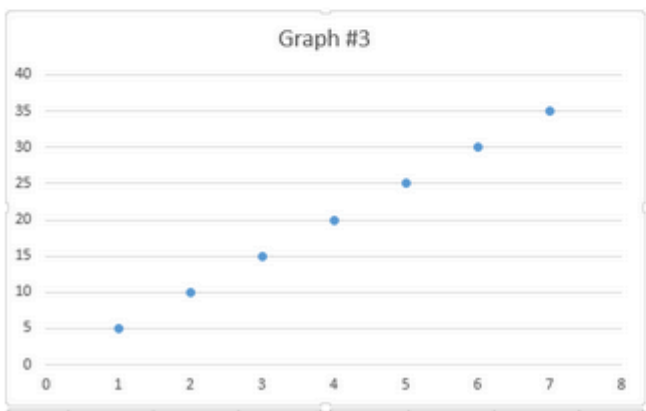
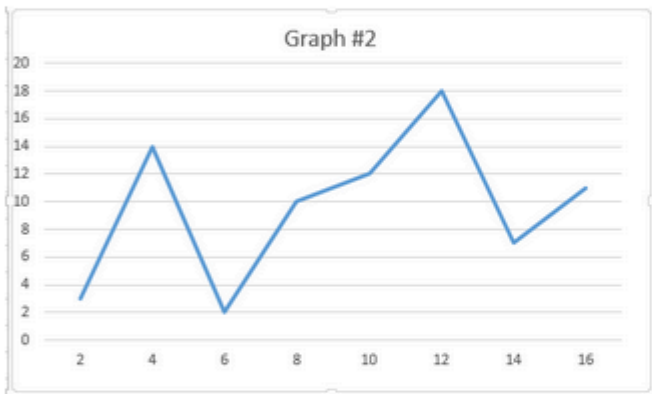
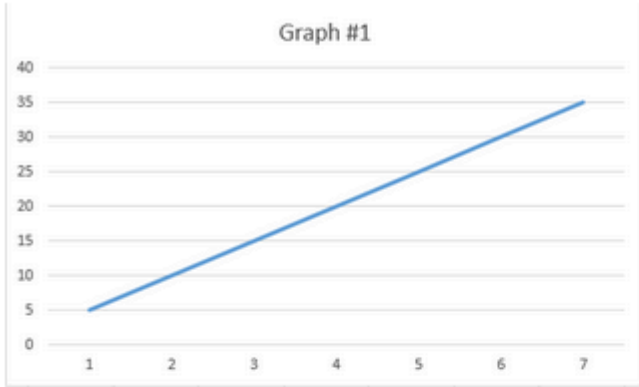
***Now let's practice deciding which graph to use.***

If we want to show the number of sneakers sold by brand in a shoe store last month, which graph should we use? Since we will be comparing the different brands, we should use a bar graph.

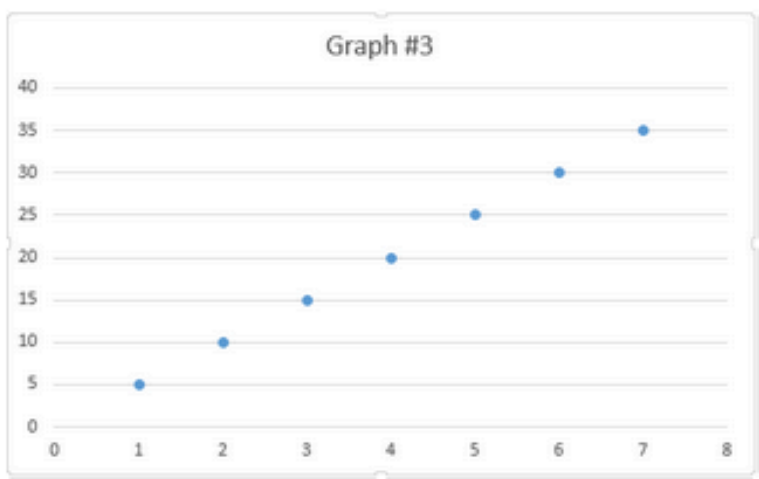
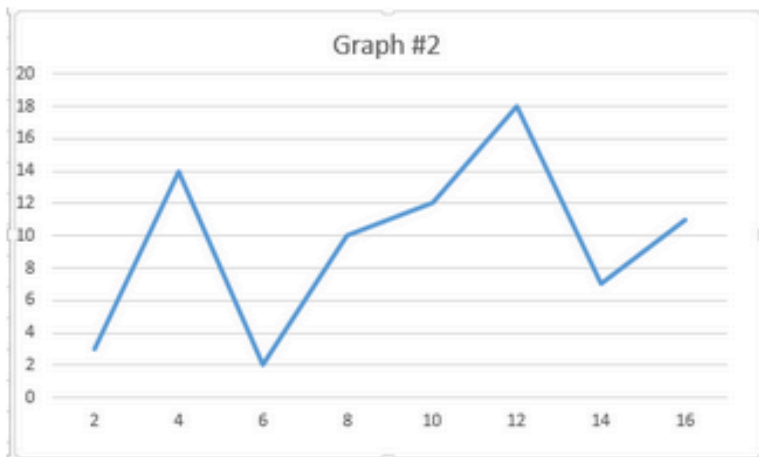
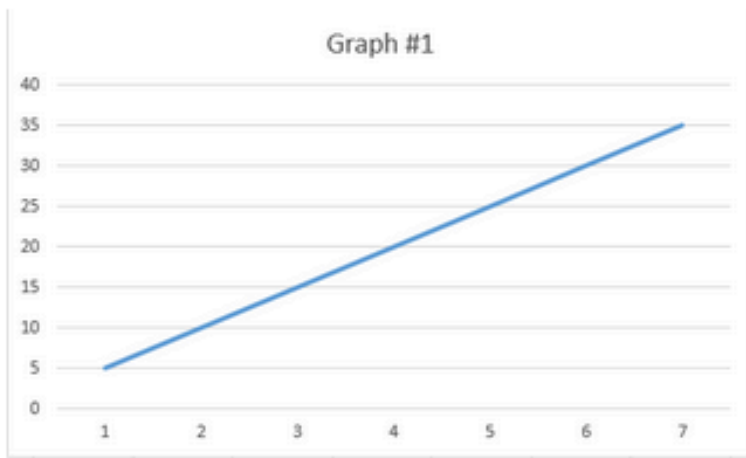
If we want to show the number of inches of snow that fell on a city over the course of the winter months, which graph should we use? In this case, we are looking at the amount of snow over a period of time, so we should use a line graph.

Now it's your turn to try a few.

Label the following graphs as having a linear or a non-linear relationship.



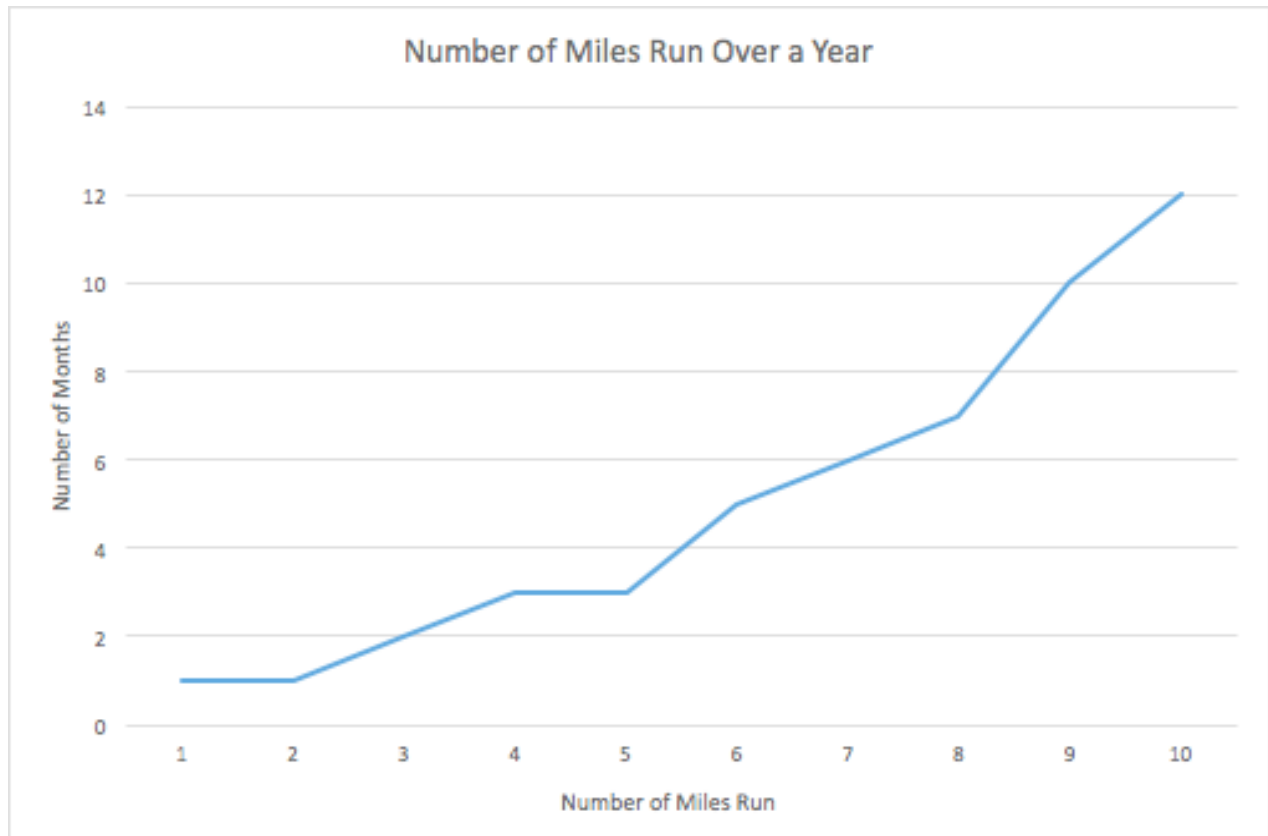
Label the following graphs as having a linear or a non-linear relationship.



## Looking for Trends

Once your information is neatly displayed in a graph, it is easy to tell if the data is increasing, decreasing, or staying the same. This is called *looking for a trend* in the data. In most experiments, we use line graphs to display our data. By looking at how the line is trending, we are able to predict what may happen in the future of our experiment.

Let's look at our graph of running again.

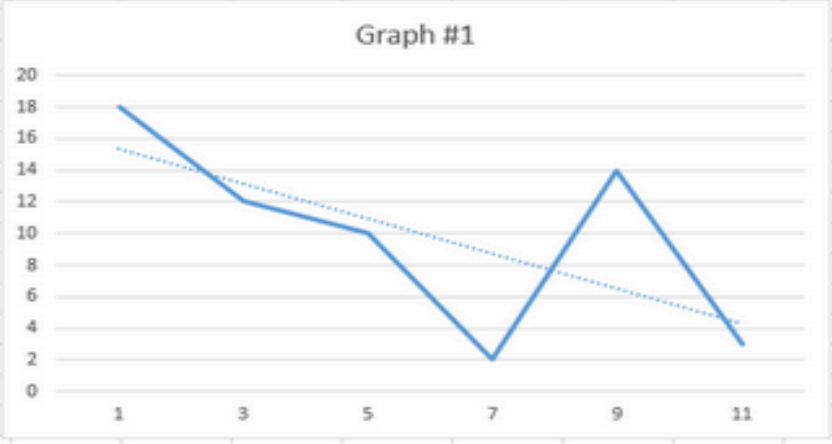
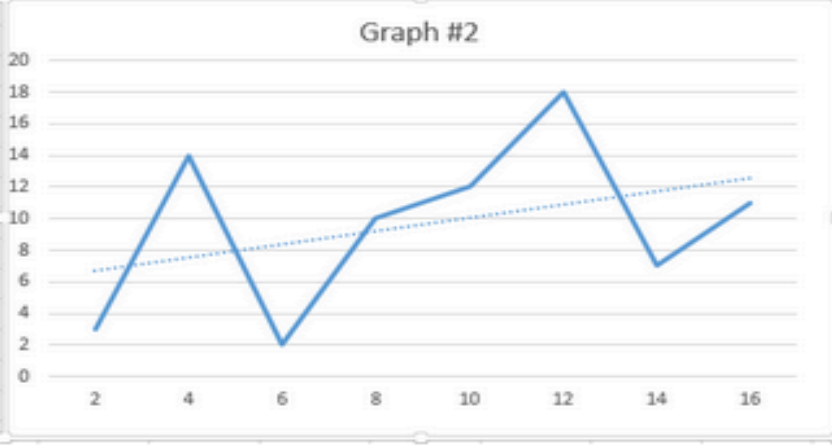
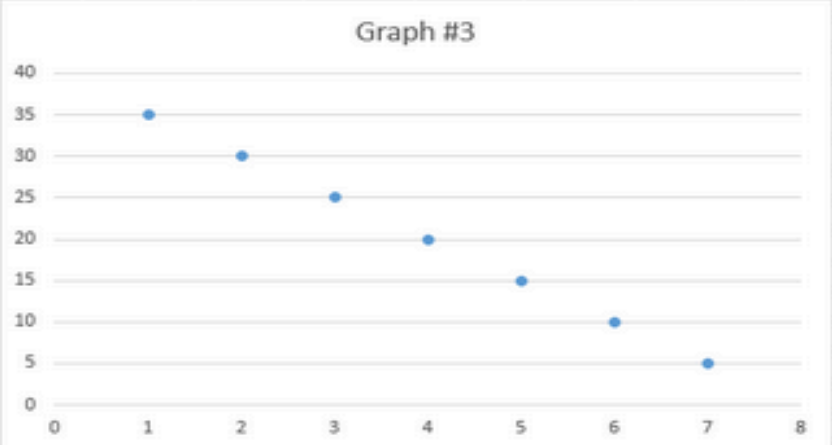


According to this graph, the longer the runner ran, the more miles he or she was able to run. Since the line continues increasing, we can say that the data shows a positive trend.

Can you find the trends on your own?



Decide whether the relationship shown in the graph supports or refutes your claim.

|   | Supports              | Refutes               |
|---|-----------------------|-----------------------|
| <p><b>Claim:</b> The more water given to the plants, the taller they will grow.</p>                     | <input type="radio"/> | <input type="radio"/> |
| <p><b>Claim:</b> The more hours of study, the higher the test grade.</p>                               | <input type="radio"/> | <input type="radio"/> |
| <p><b>Claim:</b> The more people who get the vaccine, the fewer people who contract the illness.</p>  | <input type="radio"/> | <input type="radio"/> |

## **Summary**

You did excellent work! Studying data and patterns is one of the main parts of a scientist's work. Now that you can organize your data properly and find patterns in the data, you may be able to predict the outcome of your experiment accurately. You are well on your way to working like a scientist!

If you need to review, you can click the Reteach Icon. If you are ready for the assessment, you can click on the Assessment Icon. Do your best and good luck!