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Organizing Data with Graphs

Graphs can make trends, patterns, and relationships in data easier to see.

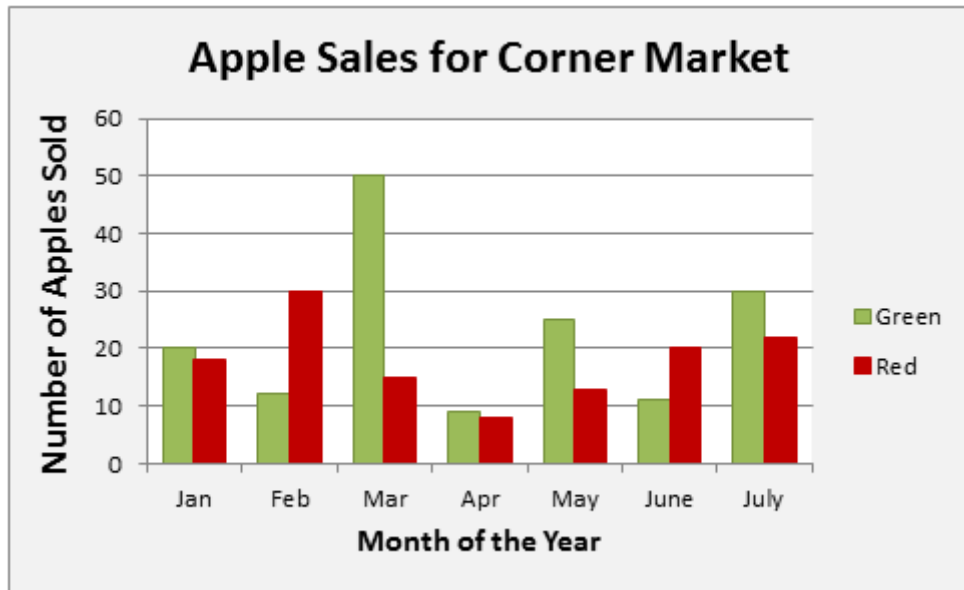
Graphs are important tools. They can be used to organize and communicate the data gathered during a scientific investigation. There are many different kinds of graphs, including:

- bar graphs
- line graphs
- circle graphs or pie charts
- pictographs

Each kind of graph is used to display a different kind of data. These different types of graphs will be discussed more below.

Bar Graphs

Bar graphs show data as different-sized blocks. Taller blocks show larger numbers. When two sets of data do not seem related in a clear way, a bar graph may be a good choice for displaying them together.



Bar graphs have an x-axis and a y-axis. Each axis should be labeled. Each line on the y-axis should stand for exactly the same number of items. In the graph above, this is ten apples. If one of the lines stood for five apples instead of ten, the graph would not give a good idea of the actual numbers involved. It is also important that all the lines on a bar graph are the same distance apart. Like all graphs, bar graphs should have a title.

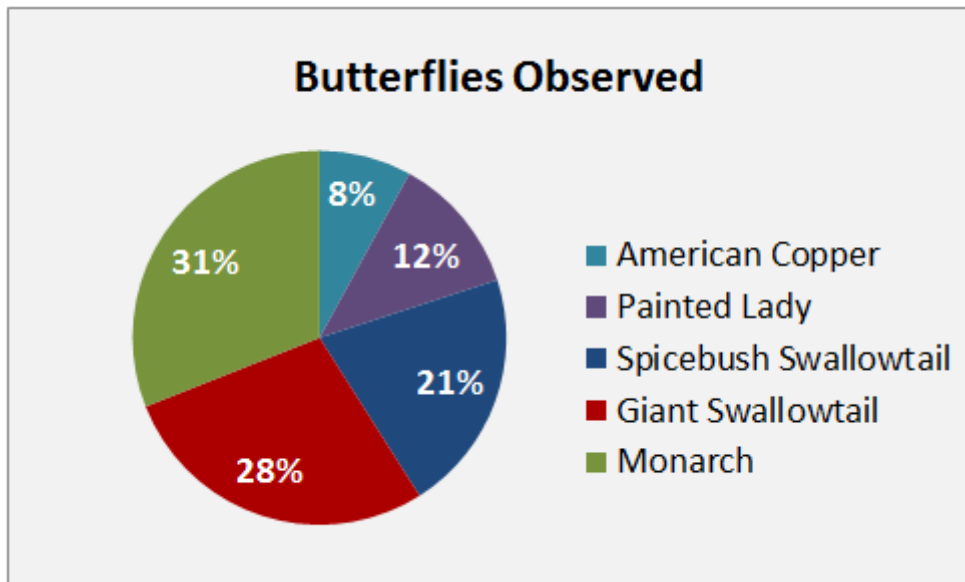
Line Graphs

When one thing has been measured in some regular way, the measurement data can be shown with a line graph. In a line graph, there are usually two sets of data. One set is put on the x-axis. The other set is put on the y-axis. The two sets of data likely show a clear relationship. For example, the numbers in one set of data may get larger when the numbers in the other set get smaller.



Circle Graphs or Pie Charts

A circle graph is a good way to show how the sizes of the parts compare to each other and to the whole. Look at the example below.

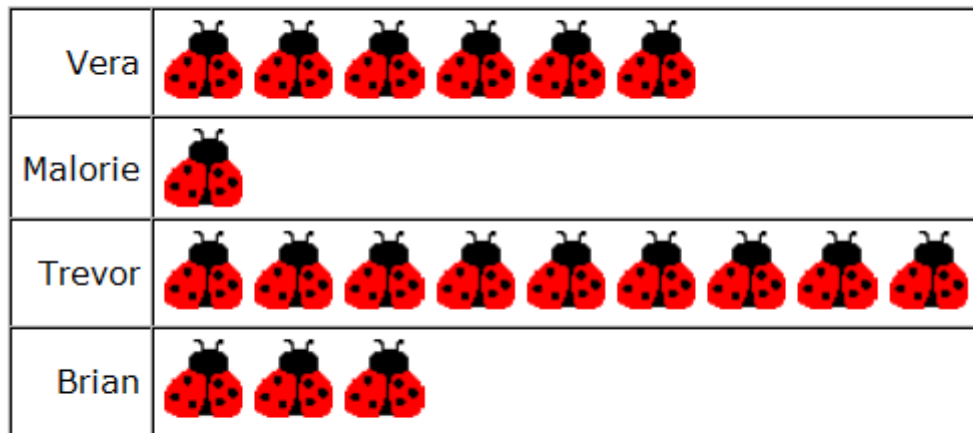



Notice that the graph has a title, a key, and labels telling exactly what percent each part of the pie stands for.

Pictographs

Pictographs are somewhat like bar charts. Rectangles are used to represent numbers in bar charts, but pictures are used to stand for numbers in pictographs. Since each picture may stand for more than one object, there must be a key telling how many objects each picture represents.

Ladybugs Found



Each  stands for 1 ladybug found.

Guidelines for Making Graphs

1. Always put a title on the graph, so other people can easily tell what the graph is showing.
2. For bar and line graphs, make sure to label each axis with the right units. For pictographs and circle graphs, make sure all units are labeled either on the graph or in a key near the graph.
3. Make sure the range on each axis of the graph is close to the same as the range of the data. If the range is too small, the data will not fit on the graph. If the range is too large, the graph will be harder to read.
4. Double check the graph against the data to make sure the graph is correct.
5. The x-axis is the horizontal axis that runs along the bottom of the graph. In a controlled experiment, the variable (the thing being changed on purpose) goes on that axis. The y-axis is the vertical (up and down) axis. The thing being measured goes on the y-axis of the graph.

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