Edgenuity

Warm-Up | Analyzing Data

Lesson Question

How are data analyzed?

Lesson Goals

Analyze data.

Examine charts and graphs to predict trends in data.

Use data to draw inferences and formulate conclusions.

Words to Know

Write the letter of the definition next to the matching word as you work through the lesson. You may use the glossary to help you.

A	quantitative data	A. a type of numerical data that can be measured
C	linear	B. not forming a straight line
B	nonlinear	C. forming a straight line
E	analyze	D. a visual representation of data
F	qualitative data	E. to examine in detail
D	graph	F. a type of nonnumerical, descriptive data

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Data

Data are the information obtained through a [scientific] investigation.

- Can be used as [evidence] to answer a question or support a conclusion
- Must be reliable and [consistent]

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Valid vs. Invalid Data

Valid data can be verified and reproduced by the researcher and other scientists.

- Invalid data may result from:
  - lack of enough data.
  - false data.
  - measurement or recording errors.
  - the inability to reproduce data.

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Types of Data

There are two ways to classify data.

- Qualitative **data** are nonnumerical, descriptive data.
  - Can be observed but not measured
- Quantitative **data** are numerical data that can be measured.

Data Analysis

Quantitative data can be displayed in different ways.

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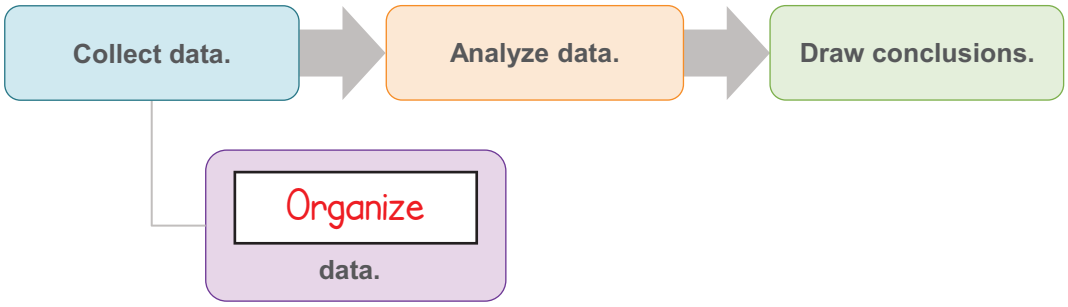
Data Analysis



Types of Graphs

A **graph** is a [visual] representation of data.

- Communicates complicated facts
- Presents [statistics] in a way that is easy to understand
- Displays data in a variety of ways

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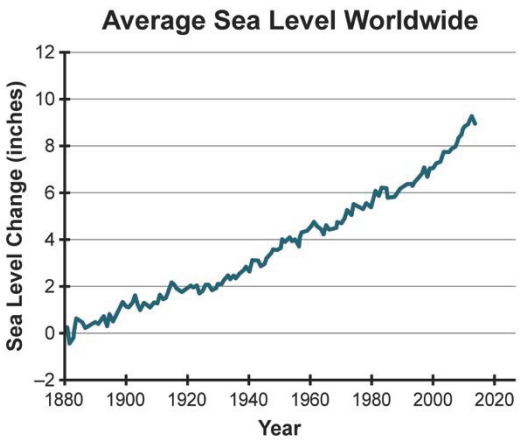
Line Graphs

Line graphs often show [changes] over a period of time.



- The *x*-axis displays the [time] period.
- The *y*-axis shows what is being measured.
- Line graphs may be [linear] or [nonlinear].
- [Equations] can be made from the data.

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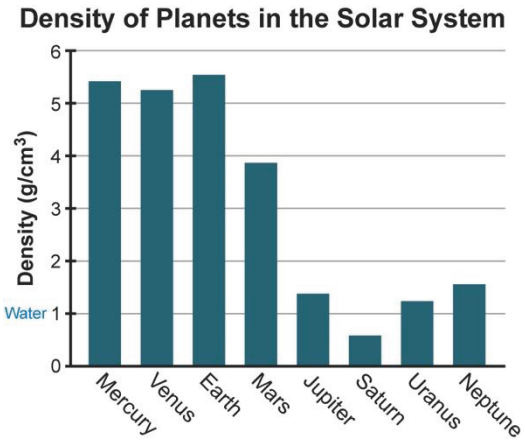
Bar Graphs

Bar graphs compare [quantities] for particular categories.

- Used to see [relationships] quickly



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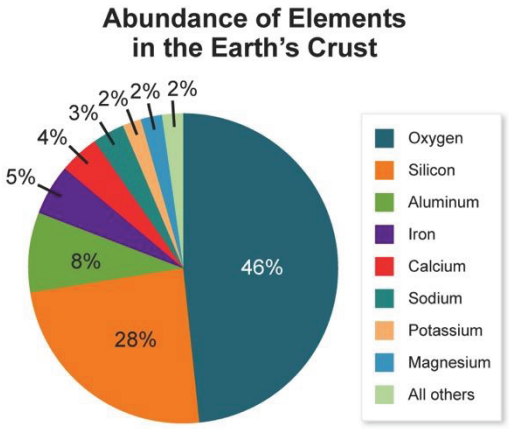
Pie Graphs

Pie graphs show the relationship among [parts] of a [whole].



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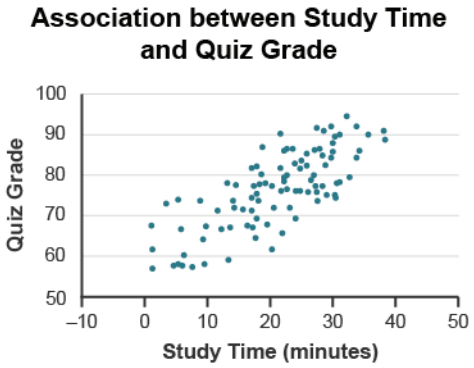
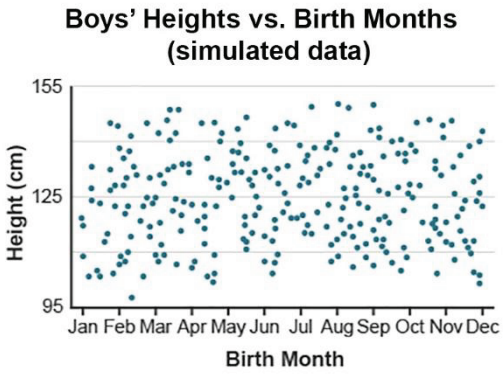
Scatterplots

Scatterplots show the relationship between two [variables].





Scatterplots are another way to display [data]. Scatterplots are a [group] of [points] that each show how one variable is affected by another variable.

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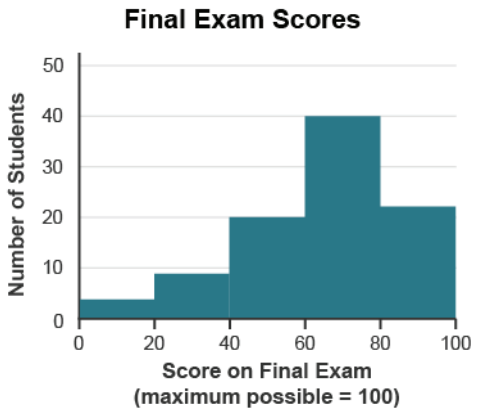
Histograms

A histogram represents the distribution of data.

- Groups numbers into ranges



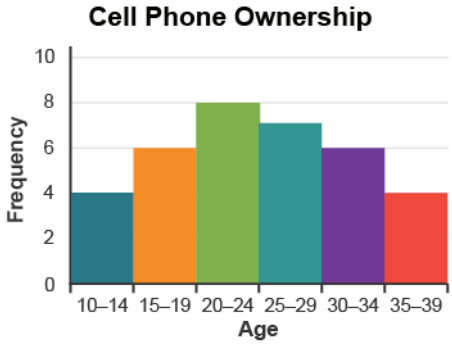
They are similar to bar graphs, but they group numbers into ranges. In other words, histograms show continuous data.

This is why there are no gaps between the bars like there often are in a bar graph.

Frequency Distributions

Frequency distributions group data into categories and show how often a particular value occurs.

Age	Frequency
10–14	4
15–19	6
20–24	8
25–29	7
30–34	6
35–39	4



The information is often displayed in a table or a bar graph or a histogram, but it can be organized in other ways.

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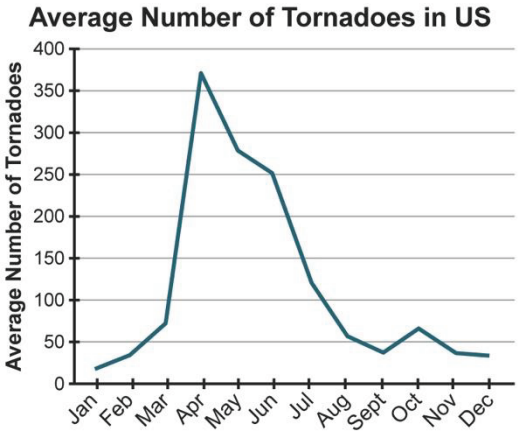
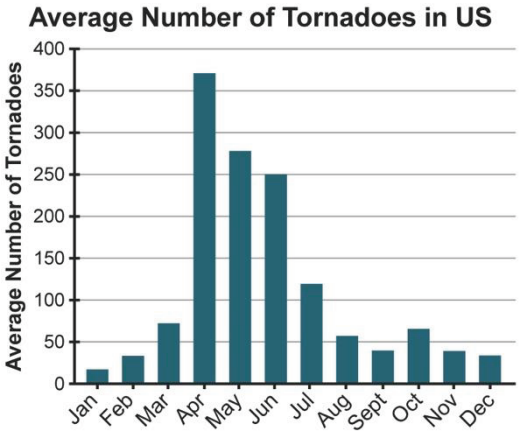
Comparing and Contrasting Graphs

We can see that data can be represented in multiple graphical interpretations.

Here we have a line graph and a bar graph. It's the [same] information, but it's displayed [differently].





This could be also represented using a [pie chart]. April would have the [biggest] slice of the [pie] with above 350 tornadoes.

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Summary | Analyzing Data

Lesson Question

How are data analyzed?

Answer

(Sample answer) To analyze data for validity and reliability, you must be able to examine charts and graphs, to predict trends in data, and to use data to draw inferences and formulate conclusions.

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Key Concepts

Valid data can be verified and reproduced by the researcher and other scientists.

- Invalid data may result from inadequate data, false data, measurement or recording errors, or the inability to reproduce data.

Key Concepts

Graphs are visual representations that display data in a variety of ways.

- Line **graphs** show changes over time.
- **Bar graphs** compare quantities for particular categories.
- **Pie graphs** show the relationship among parts of a whole.
- **Scatterplots** show the relationship between two variables.
- Histograms represent the distribution of data.
- **Frequency distributions** group data into categories and show how often a particular value occurs.

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Summary | Analyzing Data

Use this space to write any questions or thoughts about this lesson.

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