# Warm-Up | Collecting and Organizing Data

## Lesson Objectives

By the end of this lesson, you should be able to:

- Gather data through _____ and _____ observations.
- Identify tools and technology that should be used to gather accurate _____.
- Construct charts, graphs, and tables to _____ in a systematic way.

**Science Practice**: Distinguish between and give examples of observation and inference.

## Words to Know

*Fill in this table as you work through the lesson. You may also use the glossary to help you.*

| | |
|---|---|
| inference | a logical _____ made from an _____ |
| qualitative data | _____, descriptive data |
| quantitative data | _____ data that can be _____ |

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**Lesson Question**

## Types of Data

_____ data describes categories or characteristics of things. These data are nonnumeric.

_____ data refers to data that can be measured or counted.

## Qualitative Data

_____ nonnumerical, descriptive data

- Descriptions of _____, or “qualities”
- Appearance
- _____
- Behavior

## Quantitative Data

_____ numerical data that can be measured

- Describe _____, or “quantities”
- Always have _____
- Often have _____
- Are easy to _____, graph

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## Observation vs. Inference

[ ]: A logical conclusion made from an observation

- Past weather patterns can be [ ] from tree rings.
- Inferred data require sound [ ].

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## Common Measurement Tools

- [ ]: measured with a ruler, calipers, or a measuring tape
- [ ]: measured using beakers, flasks, and graduated cylinders of various sizes
- [ ]: measured using a balance
- [ ]: measured using a thermometer
- [ ]: measured using a clock or stopwatch

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## Electronic Measurement Tools

- Are _____
- Have _____ readouts
- Save _____
- Connect to _____

## Health-Monitoring Devices

Many health monitors are really _____ tools.

- Blood _____ meters
- Blood _____ meters
- Digital _____
- _____ monitors

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## Computers Can Collect and Organize Data

[ ] are an extremely important [ ] tool.

- [ ] data
- [ ] data
- [ ] data
- [ ] data

## Label Units When Collecting Data

- [ ] all units of measurement.
- Use [ ] units.
- Use [ ] units.
- Don't change [ ].

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## Organizing Data in Charts

Charts can show:

- _____ of parts.
- sequence of _____.
- _____ data.
- clear _____.

## Organizing Data in Tables

Tables

- Have _____ and _____
- Are used to record _____
- Have labels for _____, rows, and the table as a whole.

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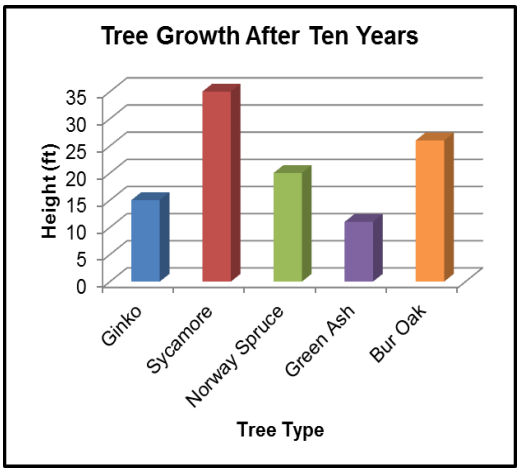
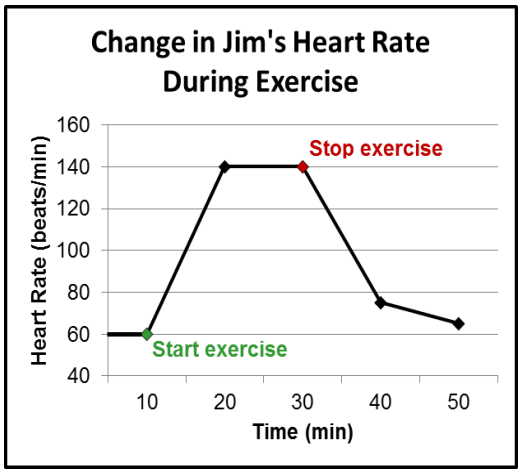
## Organizing Data in Graphs

Graphs help interpret data.

- Bar graphs: show the values of data in different categories or different ranges
- Line graphs: show the change in data over time
- Pie graphs: Show the percentage of a whole

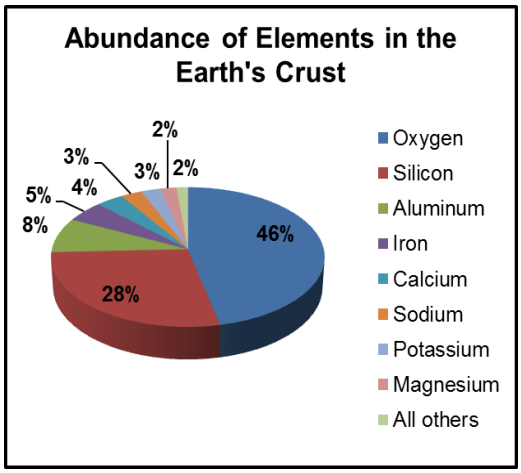
*Label each type of graph shown below.*




_____ graph

_____ graph




_____ graph

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# Summary | Collecting and Organizing Data

**Lesson Question**

What is the purpose of collecting and organizing data in scientific investigations?

**Answer**

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## Review: Types of Data

Types of data:

- _____, or nonnumerical data
- _____, or numerical data
- Directly _____, or data seen directly
- _____, or data that is a logical conclusion from a direct observation

## Review: Tools for Collecting Data

- _____ tools
- _____ measuring devices
- Computers
- Label _____ clearly with consistent units.

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## Review: Organizing Data

Ways to organize data:

- _____ : used for qualitative data
- _____ : numerical data set in columns and rows
- _____ (bar, line, pie): display data for analysis
- _____ for all parts of charts, tables, and graphs.

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

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