# Warm-Up | Analyzing Data and Drawing Conclusions

## Lesson Objectives

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

- _____ data to determine validity.
- Create _____ and _____ to analyze trends in data.
- Formulate a _____ based on observations, data, and _____.

**Science Practice:** Describe various ways _____ can be interpreted or explained.

## Words to Know

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

| | |
|---|---|
| analysis | an _____ of what occurred during an _____ |
| conclusion | the overall _____ of the results of an investigation and their meaning |
| qualitative data | non-numerical, _____ data |
| quantitative data | _____ data that can be measured |

© Edgenuity, Inc.

# Instruction
Part 1

# Analyzing Data and Drawing Conclusions

Slide 1

**Lesson Question**

Slide 2

## Valid and Invalid Data

_____ are accurate data that can be _____ and _____ by the researcher and other scientists.

What makes data invalid?

- _____ data
- Measurement or recording _____
- _____ data
- Inability to be _____ when the experiment is _____

## Duke University Cancer Research Scandal

**REAL-WORLD CONNECTION**

- In 2006, cancer researchers at Duke University published articles to two medical journals.
- Some _____ in the articles had been published without _____.
- The scientists conducted a clinical _____ without correcting their errors.
- Some patients received _____ chemotherapy or delayed _____.
- Duke University and its researchers were _____ by patients and survivors.

© Edgenuity, Inc.

# Instruction
Part 1

# Analyzing Data and Drawing Conclusions

Slide 4

## Safety in Numbers

Repetition _____ validity by:

- increasing the chances that _____ are _____ responses.
- making sure that the experiment is _____ .
- _____ that results are interpreted correctly.

## Maintaining Control

What do you control in an experiment?

_____

- Including a control variable helps you make sure that any response you see is due only to the change in the independent variable.

_____

- Keeping all the conditions the same during the experiment for each sample keeps you from introducing variability into the experiment.

© Edgenuity, Inc.

# Instruction
Part 1

# Analyzing Data and Drawing Conclusions

Slide 7

## Data and Analyses

There are two ways to classify data.

- _____ data is nonnumerical, descriptive data.
- _____ data is numerical data that can be measured.

An _____ describes what happened during an experiment

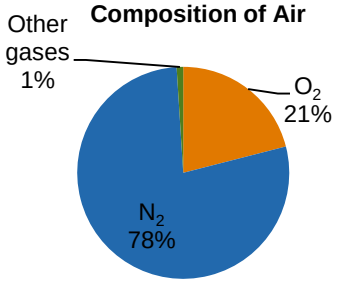
## Charts vs. Graphs

*Identify which is a chart and which is a graph.*

**Eye Color in Humans**

| | | Male | |
|---|---|---|---|
| | | B | b |
| **Female** | B | BB | Bb |
| | b | Bb | bb |

B = Brown b = Blue




This is an example of a _____, which shows relationships between parts, qualitative data, or a sequence of events.

This is an example of a _____, which is used to interpret quantitative data.

© Edgenuity, Inc.

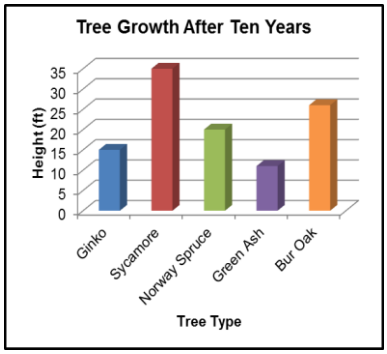
# Instruction
## Part 1

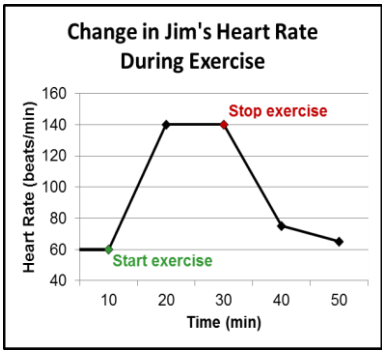
# Analyzing Data and Drawing Conclusions

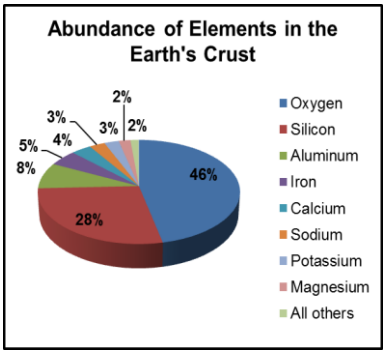
Slide 7

## Types of Graphs

*Label each type of graph shown below.*




This is an example of a _____ graph.

These graphs show the values of data in different categories or different ranges

This is an example of a _____ graph.

These graphs show the change in data over time.

This is an example of a _____ graph.

These graphs show the percentage of a whole.

## Parts of a Graph

Always include the following in a graph:

- _____—should tell the viewer exactly what the graph is about.
- _____—titles identify the two variables and should include units if representing quantitative data.
- _____ and _____—The *x*-axis represents the independent variable (manipulated), and the *y*-axis represents the dependent (responding) variable.

© Edgenuity, Inc.

# Instruction
Part 1

# Analyzing Data and Drawing Conclusions

Slide 7

## How to Create a Graph

**STRATEGY**

To create a graph, you need to know:

- the _____ and _____ variables.
- the type of _____ being graphed.
- the data _____ for each variable.

Slide 9

## Trends on Graphs

What can be learned from a graph?

- What was being _____ : Type of fertilizer
- What was being _____ : The height of the pansies
- The _____ of the experiment: The data points represented by each column on the graph
- Any _____ that might be revealed: How the effects of different fertilizers compared over time.

© Edgenuity, Inc.

# Instruction
Part 2

# Analyzing Data and Drawing Conclusions

Slide 2

## Conclusions Are Explanations

[ ] : An explanation that utilizes data from the experiment to support or reject the hypothesis

A good conclusion:

- [ ] the situation that led to the original question.
- restates the [ ] .
- explains your [ ] and [ ] .
- explains why the data *does* or *does not* [ ] the hypothesis.
- includes related [ ] to explore in the future.

© Edgenuity, Inc.

# Instruction
Part 2

# Analyzing Data and Drawing Conclusions

Slide 4

## Conclusions and Hypotheses

_____ are **If . . . then . . . because** statements with a possible _____ based on _____ research or knowledge.

*Complete the sentence with the words that indicate that this statement is a hypothesis.*

_____ day length increases, _____ the plant will store more glucose _____ its leaves are exposed to light for a longer period of time.

_____ explain why a _____ **was** or **was not** supported by the _____ .

*Complete the sentence with the words that indicate that this conclusion supported a hypothesis.*

My hypothesis _____ because leaves from the plant exposed to longer periods of light contained more glucose than leaves exposed to shorter periods of light.

© Edgenuity, Inc.

# Summary | Analyzing Data and Drawing Conclusions

**Lesson Question**

How can data be used to draw inferences?

**Answer**

Slide 2

## Review: Validity of Data

- Data must be _____ to be valid.
- Repeated trials _____ data validity.
- Controlling _____ and _____ is necessary to obtain valid data.
- Valid data are important for _____ of the research and the researcher.

© Edgenuity, Inc.

# Summary | Analyzing Data and Drawing Conclusions

Slide 2

## Review: Data and Trends

- Data can be _____ or _____.
- Charts represent _____ between parts, _____ of events, or _____ data.
- Graphs are used to interpret _____ data.
- The three most common types of graphs are _____ graphs, _____ graphs, and _____ graphs.
- Graphs and charts should contain all the information needed for _____.

## Review: Conclusions

Conclusions are _____ that use _____ from the experiment to support or reject the hypothesis.

Conclusions in lab reports should:

- _____ the situation that led to the original question.
- restate the _____.
- explain your _____ and _____.
- explain why the _____ **does** or **does not** _____ the hypothesis.
- include related _____ to explore in the future.

© Edgenuity, Inc.

# Summary | Analyzing Data and Drawing Conclusions

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

© Edgenuity, Inc.