



## Scientific Investigation and Reasoning: Analyzing Data to Identify Patterns and Relationships

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**Student Name:** \_\_\_\_\_

**Class:** \_\_\_\_\_

**Due Date:** \_\_\_\_\_

### Introduction

In this homework assignment, you will apply the principles of scientific investigation and reasoning to analyze and interpret scientific data, identifying patterns and relationships. This assignment is aligned with the TEK 7.3A standard and is designed for 14-year-old students in a science class.

## Activity 1: Data Analysis

Analyze the following data set:

Temperature (°C)	Plant Growth (cm)
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20	5
22	6
25	8
28	10
30	12

1. Identify any patterns or relationships between temperature and plant growth.

2. Create a graph to visualize the data.

3. What conclusions can you draw about the relationship between temperature and plant growth?

## Activity 2: Pattern Identification

Examine the following statements:

- As temperature increases, plant growth increases.
- The relationship between temperature and plant growth is linear.
- The optimal temperature for plant growth is between 25°C and 30°C.

1. Determine which statements are supported by the data.

2. Provide evidence from the data to support your conclusions.

### Activity 3: Critical Thinking

Consider the following questions:

1. What are some potential limitations of this study?

2. How could the study be improved to provide more accurate results?

3. What are some real-world applications of this research?

#### Activity 4: Experimental Design

Design an experiment to investigate the effect of light intensity on plant growth.

1. Identify the independent and dependent variables.

2. Describe the materials and procedures needed to conduct the experiment.

3. Explain how you would collect and analyze the data.

### Activity 5: Case Study

Research a real-world example of how scientific data analysis has led to a significant discovery or innovation.

1. Describe the problem or question being investigated.

2. Explain the methods used to collect and analyze the data.

3. Discuss the findings and their implications.

## Questions for Reflection

1. What did you learn about scientific investigation and reasoning from this assignment?

2. How can you apply the principles of scientific investigation and reasoning to real-world problems?

3. What are some areas where you need more practice or review?

## Success Criteria

To successfully complete this assignment, you must:

- Accurately analyze the data and identify patterns and relationships.
- Clearly communicate your findings in a well-organized report.
- Provide evidence from the data to support your conclusions.
- Demonstrate critical thinking and problem-solving skills.



## Additional Resources

For students who need extra support or challenge:

- Online resources, such as Khan Academy or Science Buddies, can provide additional guidance and practice with data analysis and scientific investigation.
- Advanced students can research and explore more complex topics, such as statistical analysis or experimental design.

