Independent Dependent Variable Worksheet

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Part 1: Building a Foundation

What is the role of an independent variable in an experiment?

Hint: Think about what the researcher changes.

- ◯ A) It is the variable that is measured.
- ◯ B) It is the variable that is manipulated.
- ◯ C) It is the variable that is kept constant.
- ◯ D) It is the variable that is ignored.

Which of the following are characteristics of a dependent variable? (Select all that apply)

Hint: Consider how the dependent variable is affected in an experiment.

- ☐ A) It is manipulated by the researcher.
- ☐ B) It is measured in the experiment.
- ☐ C) It is affected by the independent variable.
- ☐ D) It remains constant throughout the experiment.

Define a control variable and explain its importance in an experiment.

Hint: Think about what needs to be kept the same.

List two differences between a control group and an experimental group in an experiment.

Hint: Consider the roles of each group in the experiment.

1. Difference 1

2. Difference 2

Part 2: Comprehension and Application

Why is it important to control confounding variables in an experiment?

Hint: Think about the factors that could affect the results.

- ◯ A) To increase the number of variables studied.
- ◯ B) To ensure the independent variable is the only factor affecting the dependent variable.
- ◯ C) To make the experiment more complex.
- ◯ D) To reduce the cost of the experiment.

Which of the following statements are true about experimental design? (Select all that apply)

Hint: Consider the roles of different variables in an experiment.

- ☐ A) The independent variable is the presumed cause.
- ☐ B) The dependent variable is the presumed effect.
- ☐ C) Control variables are changed to see their effect.
- ☐ D) Confounding variables are intentionally introduced.

Describe a real-world scenario where identifying the independent and dependent variables would be crucial for understanding the outcome.

Hint: Think about a situation where changes can be measured.

In a study examining the effect of sunlight on plant growth, what would be the independent variable?

Hint: Consider what is being changed in the study.

- ◯ A) Type of plant
- ◯ B) Amount of sunlight
- ◯ C) Soil quality
- ◯ D) Water frequency

Part 3: Analysis, Evaluation, and Creation

Which of the following best describes the relationship between independent and dependent variables?

Hint: Think about how one variable affects the other.

- ◯ A) The independent variable is dependent on the dependent variable.
- ◯ B) The dependent variable is manipulated to see its effect on the independent variable.
- ◯ C) The independent variable is manipulated to observe its effect on the dependent variable.
- ◯ D) Both variables are manipulated simultaneously.

In an experiment, if the results show a change in the dependent variable, what could be the possible reasons? (Select all that apply)

Hint: Consider all factors that could influence the results.

- ☐ A) The independent variable caused the change.
- ☐ B) A confounding variable influenced the results.
- ☐ C) The control variables were not properly maintained.
- ☐ D) The dependent variable was measured incorrectly.

When evaluating an experiment, which factor is most critical to ensure the results are valid?

Hint: Think about what makes an experiment reliable.

Propose a simple experiment, including the identification of the independent, dependent, and control variables, and explain how you would ensure the results are reliable.

Hint: Think about a straightforward experiment you could conduct.