

## Independent and Dependent Variables

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### Lesson Overview

In this lesson, students will work in collaborative groups to determine what part of a statement contained the independent variable and what part contained the dependent variable. They will sort the independent and dependent variables into a t-chart graphic organizer.

### Standards Addressed

SC 2005      7-1.2 Generate questions that can be answered through scientific investigation.

SC 2014      7.S.1A.1 Ask questions to (1) generate hypotheses for scientific investigations, (2) refine models, explanations, or designs, or (3) extend the results of investigations or challenge claims.

### Disciplinary Literacy Best Practices

Collaborative Groups

Graphic Organizer (T-chart)

### Lesson Plan

Time Required – Two 45-minute class periods

Disciplinary Vocabulary –independent variable, dependent variable

Materials Needed:

- Independent/Dependent Variables Worksheet
- Markers
- Scissors
- Glue
- construction paper

Assessment: completed T-chart

## Engage

- Begin with the following task: “Is the data in this statement qualitative or quantitative? Explain why you selected the answer you did.”
- “Statement: I saw three red birds in the tree outside of my classroom window.”
- Discuss the meaning of independent and dependent variables. Provide several examples for the students to try as a whole class.
  - Examples:
    - The height of the bean plants depends on the amount of water they receive.
    - The time it takes to run a kilometer depends on the amount of exercise a person gets.
    - The higher the temperature of water, the faster the egg will cook.
    - The temperature of water was measured at different depths of the lake.

## Explore

- Divide students into groups of size four. Assign a role to each student in each collaborative group.
- Shortest Person: Group Facilitator, Tallest Person: Handler of Scissors, Person with Longest Hair of Remaining Students: Gluer, Remaining Person: Decision Maker. If there is an odd number of students, the remaining person is assigned the role of floating task master.
- Provide each group with the worksheet of statements including independent variables and dependent variables.
- Groups should read each statement, cut the independent variable apart from the dependent variable and glue the pieces onto their t-chart. The t-chart should have one column for independent variables and one column for dependent variables.

## Explain

- Student groups will share with one another how they made selections for placing the information on the t-chart.
- Teacher will address misconceptions about independent and dependent variables.

### **Teacher Reflections and Biographical Information**

It was unclear to the students that they were to cut the each sentence into two separate parts. Some thought that they were to cut the sentences apart from one another and glue the entire sentence under one of the headings. It is helpful if students draw lines across the T-chart paper to line the independent cutting across from the dependent cutting.

**Lesson Author:** Jane Meadors is a seventh grade science teacher at Bell Street Middle School in Clinton, SC. She has been in the field of education for more than twenty years. She has experience in special education self-contained and resource at the middle school level and resource at the high school level. Her most recent education experience has been in seventh and eighth grade math. She holds a BS in Education from Presbyterian College and a Master's Degree in Special Education from Converse College.

## Worksheet: Independent and Dependent Variables

Identify the independent variable and dependent variable in each statement. Cut them apart and glue them to the appropriate section of the t-chart.

1. The temperature of the air was measured at several times during the day.
2. The number of kilometers per liter of gasoline was measured for cars traveling at different speeds.
3. The average weight of ten pumpkins growing in a patch was determined at different times after planting.
4. A box was dropped from an airplane and the distance it had fallen was measured after various lengths of time.
5. The number of letters recognized on an eye chart was measured to see if it was affected by distance.
6. The length of string increases as the number of objects hanging from it increases.
7. The average electric bill increased as the number of people living in the home increased.
8. A potato is cut in two pieces and allowed to dry in the sun. The weight of the potato is measured as the days pass.
9. A fire chief is doing an analysis of his men at work. He measures the average time it takes a fireman to climb ladders of different lengths.
10. A flock of Leghorn chickens is divided into two groups. One group is fed Brand X and the other is fed Brand Y. The weights of the two groups of chickens are compared.
11. The body temperature of cold blooded animals increases as the temperature of its environment increases.
12. Various types of soils are tested to see which type retains the most water.