

Independent and Dependent Variables

Reporting Category Patterns, Functions, and Algebra

Topic Identifying independent and dependent variables

Primary SOL 8.17 The student will identify the domain, range, independent variable, or dependent variable in a given situation.

Related SOL 8.14, 8.16

Materials

- Independent and Dependent Variables activity sheet (attached)
- Poster Directions (attached)
- Poster paper
- Markers

Vocabulary

function, Independent variable, dependent variable, domain, range (8.17)

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Discuss with students what they already know from science class about independent and dependent variables. Develop a definition for each term.
2. Distribute copies of the Independent and Dependent Variables activity sheet. Have students work with partners to identify the independent and dependent variables for each situation presented on the chart.
3. When students have finished, have them present their solutions and defend their reasoning.
4. Distribute copies of the Poster Directions, poster paper, and markers. Have students complete the poster project.
5. Display the posters, and have students present their variables to the class.

Assessment

- **Questions**
 - When finding the area of a circle, what is the independent variable? What is the dependent variable?
- **Journal/Writing Prompts**
 - Explain why it is important to know the difference between an independent variable and a dependent variable.
 - Explain how independent and dependent variables are related to domain and range.

Extensions and Connections (for all students)

- Have students create a mnemonic device to remember the relationship between domain and independent variable and between range and dependent variable.

Strategies for Differentiation

- Create a table to show all the different vocabulary for *input* and *output*.
- Have students identify the domain and range of given graphs and tables.
- Highlight key words that can assist students with identifying whether a variable is dependent or independent.

Independent and Dependent Variables

Name _____ Date _____

Identify the independent and dependent variables for each situation described below.

	Independent Variable	Dependent Variable
John measures the length and width of each side of a rectangle. He uses those values to calculate the area.		
$y = 4x + 1$		
David measures how many inches his tomato plant grows every week.		
Marks works full time as a busboy at a local café. He earns \$6 per hour and then an additional \$3 per hour for each hour over 40 hours that he works per week.		
The number of gum balls, g , that can be packaged in a box with a volume of V cubic units is given by $g = 40V + 15$.		
Jake works as a sales representative. He earns \$1,275 per month plus an 8% commission on his total sales.		

Poster Directions

Make a poster that uses pictures to show the difference between a dependent variable and an independent variable. Find or devise an example of a dependent variable and an example of an independent variable, using the list below as a start. Your poster must have the following:

- A title
- Two pictures, one illustrating each variable (Pictures may be either drawn, cut out from newspapers or magazines, or printed from the Internet.)
- Labels for “Dependent Variable” and “Independent Variable”
- A caption that says: “_____ depends on _____.”

DEPENDENT	INDEPENDENT
Cell phone bill	Minutes used
How far you can drive	The amount of gas you have
Your math grade	The number of assignments you turned in
How much money you earn	The hours you work
Cost of a speeding ticket	How many miles you went over the speed limit
Time it takes to drive somewhere	How fast you drive
Result of a football game	Who scores more points
How much air conditioning you use	Temperature
Total calories and fat	Number of cookies
Opportunities for high-paying jobs	How much education you have