Key

Math 1

Name_____

Lesson 1-3 Independent and Dependent Variables

Date_____

Learning Goal:

- *I can identify the independent and dependent variables and describe their relationship.*

What's an independent variable?

It is a variable that stands alone and isn't changed by the other variables you are trying to measure. (CAUSE)

What's a dependent variable?

It is something that depends on other factors. (EFFECT)

☆ The *Independent variable* causes a change in the *Dependent variable* ☆

Example:

Time Spent Studying (independent variable) causes a change in *Test Score* (dependent variable) and it isn't possible that *Test Score* could cause a change in *Time Spent Studying*.

In the tables below either an independent or dependent variable is listed. Fill in the other side of the table with several variables that will make the comparison make sense.

Independent Variable	*Dependent Variable*
Age of a person	height weight glasses prescription # of video games they own Miles driven in a car

Independent Variable	*Dependent Variable*
hours studying # of missed assignments hours of sleep each night hours of vid. games played IQ	A students test score

D = Dependent I = Independent

In numbers 1-6, label each of the variables as independent or dependent variables.

1. Tamara's daughter is a dancer who will be participating in an upcoming recital. For each dance her daughter plans to perform, she will require a different costume.

D c = the number of costumes Tamara's daughter will require

I d = the number of dances Tamara's daughter plans to perform

2. Yardena is planning her wedding. The number of announcements she orders is determined by the number of guests she wants to invite.

I g = the number of guests

D a = the number of announcements

3. Spencer goes biking every morning. The farther he bikes, the more calories he burns during the bike ride.

D c = the number of calories Spencer burns during the bike ride

I d = the distance Spencer bikes

4. A committee is organizing a music festival in Jefferson County. The amount of time that the venue has been reserved for determines the number of bands that will be able to play at the festival.

I t = the amount of time that the venue has been reserved for

D b = the number of bands that will be able to play

5. Carson is selling lemonade. The number of cups of lemonade he sells determines how much money he earns.

D m = the amount of money Carson earns

I c = the number of cups of lemonade Carson sells

6. During the winter, a trucking company ships produce from California to Cleveland. The more produce the company needs to ship, the more truckers it will hire.

D t = the number of truckers the company will hire

I p = the amount of produce the company needs to ship

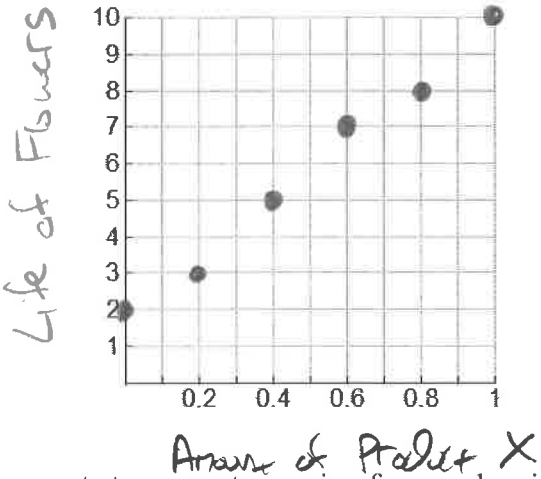
For numbers 7 and 8, identify the independent and dependent variables in the given situation, graph the data on the coordinate plane and label the axes appropriately.

7. A florist wants to see if the amount of Product X will extend the life of cut flowers so that they last longer.

Independent – Amount of Prdct X

Dependent – Life of cut flowers

Independent Variable	0	0.2	0.4	0.6	0.8	1
Dependent Variable	2	3	5	7	8	10

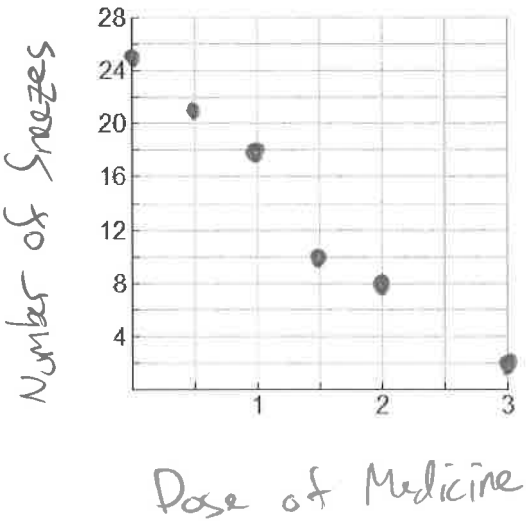


8. A drug company wants to prevent sneezing for people with grass allergies. They test different doses of their new drug.

Independent – Dose of Medicine

Dependent – # of sneezes

Independent Variable	0	0.5	1	1.5	2	3
Dependent Variable	25	21	18	10	8	2



For numbers 9 and 10, read the situation, write an equation to represent the situation and solve the equation for the independent variable.

9. The Mayfield Drama Club is having a three day performance of Tarzan. If the tickets are free they will give away 750 tickets. The math department calculates that for every $1 increase in the cost of a ticket price that 23 less tickets are sold.

a. Using n to represent the number of ticket sold and c to represent the cost of a ticket, identify the independent and dependent variables.

n is dependent, c is independent.

b. Write an equation to represent this situation. *Check with you teacher before answering the next question.*

$n = 750 - 23c$

c. Solve the equation for the independent variable.

$n - 750 = -23c$

$c = -\frac{n-750}{23}$ or $\frac{-n+750}{23}$ or $\frac{750-n}{23}$

d. If 566 tickets are sold, then what was the ticket price?

$c = \frac{750-566}{23} = \frac{184}{23} =$ $8 per ticket

10. There is a glacier located in Math Valley and it began melting due to global warming. The front of the glacier began at an elevation of 125 feet. The glacier moves up the valley at a rate of 2.25 feet per day.

a. Using E to represent the glaciers current elevation and d to represent the number of days since the melting began, identify the independent and dependent variables.

E is dependent & d is independent

b. Write an equation to represent this situation. *Check with you teacher before answering the next question.*

$E = 125 + 2.25d$

c. Solve the equation for the independent variable.

$E - 125 = 2.25d$

$d = \frac{E-125}{2.25}$

d. If the glacier is at an elevation of 149.75 feet, how days have passed since the melting began?

$d = \frac{149.75-125}{2.25} =$ 11 days