Worksheet
Lesson 2 - Functions Unit

Warm - up

Think about your phone's battery level, as a percentage, and the amount of time it has been charging.

1. What are the variables involved in this situation?
2. What values can these variables take?
3. What happens to one variable when the other increases?

Activity 1

Can there be more than one battery percentage at a time?

Let's go back to the earlier context, where we looked at the relationship between your phone's battery percentage and the time since it started charging.

1. In this situation, we identified two variables. Which variable depends on the other?
2. Suppose your phone was completely dead and you charge it for 20 minutes. Is it possible that at that moment the battery percentage is both 50% and 55%?
3. In general, if you charge your phone for a set amount of time, is it possible for it to show more than one battery percentage at that same moment?

Activity 2

Is it a function?

In the previous activity, we saw that the battery percentage of a phone is a function of charging time. This means there is a dependent relationship between these two variables, where each value of the independent variable (charging time) corresponds to exactly one value of the dependent variable (battery percentage). Below are other examples of dependent relationships between two variables. Identify which of these are functions by answering the questions.
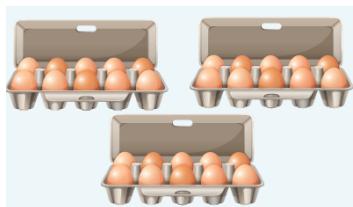
Situation 1
Independent variable: number of cartons
Dependent variable: total number of eggs (C)
Note: each carton contains 12 eggs.

a) Is it possible that, for some value of the independent variable (number of cartons), there is more than one value of the dependent variable (total number of eggs)? Explain your answer.

b) Based on this, can we consider that the total number of eggs is a function of the number of cartons? explain your answer.

Situation 2
Independent variable: type of fruit (f)
Dependent variable: color of the fruit(C)

a) Is it possible that, for some value of the independent variable (type of fruit), there is more than one value of the dependent variable (color of the fruit)? Explain your answer.

b) Based on this, can we consider that the total number of eggs is a function of the number of cartons? explain your answer.

Situation 3
Independent variable: person (p)
Dependent variable: left thumbprint (H)

a) Can we consider the left thumbprint to be a function of the person? Explain your answer.

a) Can we consider the temperature to be a function of the time of day? Explain your answer.

Situation 4
Independent variable: time of day (*h*)
Dependent variable: temperature (*T*)

Activity 3
Is it a function?

Complete the following table using function notation y=f(x) for each case. When needed, choose letters to represent the variables and the function.

Description of the function	Function notation
f relates the maximum annual temperature (*T*) as a function of the year (*a*).	*T=f(a)*
g relates the perimeter of a circle (*P*) as a function of its radius (*r*).	
The area of the square *A* is a function of its side length *L*.	
Fatigue during exercise is a function of heart rate.	
The temperature of a cup of tea is a function of the time since it was served.	
The speed of an athlete is a function of elapsed time.	
Elapsed time is a function of an athlete's speed.	