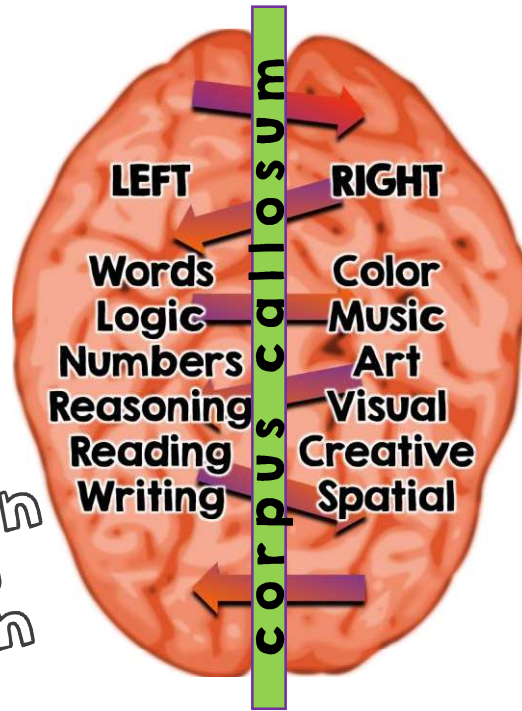


# Brain Benefits



Memory  
Focus  
Relaxation  
Problem Solving  
Attention  
Creativity  
Energy  
Alertness  
Concentration  
Engagement  
Coordination  
Retention



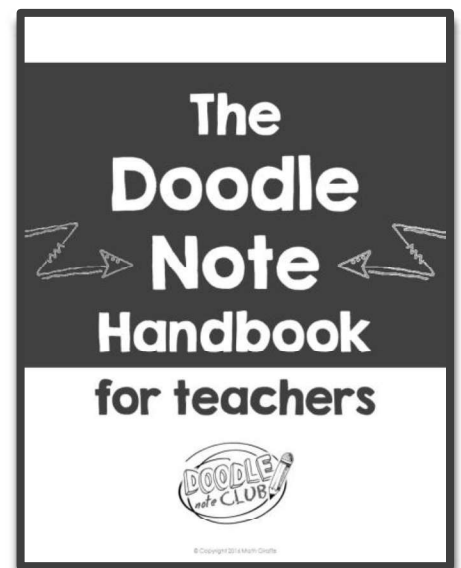
Integrating doodle notes into the classroom experience activates both hemispheres of the brain at the same time. When a student engages in coloring, doodling, or artistic embellishment of their lesson material, the two sides of the brain work together.

## How to Use Doodle Notes

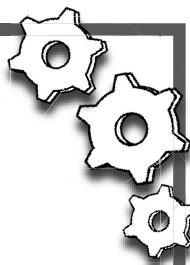
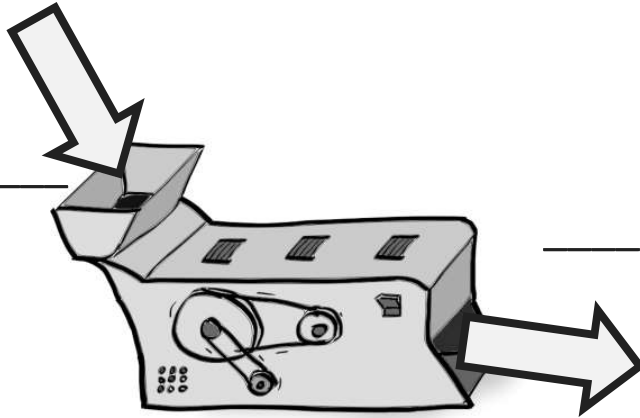
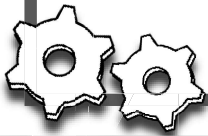
Maximize your students' retention, focus, and more!

Learn all about the brain-based doodle note strategy ...

Download your  
**FREE** Doodle Note  
Handbook [here](#)



# the function machine



A function is a \_\_\_\_\_  
 \_\_\_\_\_  
 with one or more \_\_\_\_\_  
 \_\_\_\_\_  
 where each \_\_\_\_\_  
 \_\_\_\_\_  
 has a single \_\_\_\_\_.

# functions

Each \_\_\_\_\_ is only allowed to correspond to ONE \_\_\_\_\_!

This relation is a function because none of the input values (x-values) has more than one different output (y-value).

x	0	1	2	3	4
y	0	3	6	9	12

This relation is NOT a function because at least one of the input values (x-values) has more than one different output (y-value).

x	-3	2	-3	5	8
y	1	5	-1	2	-2

## notation

When dealing with functions, you will see \_\_\_\_\_ in place of y.

How to say it out loud: " \_\_\_\_\_ "

## evaluating

To evaluate a function for a particular x-value, just \_\_\_\_\_ and then simplify!

**Example:** If  $f(x) = 2x + 1$ , find  $f(3)$ .

Work:  $f(3) = 2(3) + 1$

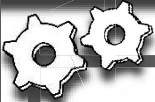
Answer: \_\_\_\_\_

When we put something IN,  
 we can always expect a consistent result  
 to come back OUT.

Name: \_\_\_\_\_

# determining whether a relation is a function

Add circles, arrows, lines, etc. to demonstrate why each relation is/isn't a function.



## table

Review the columns. The relation will not be a function if any \_\_\_\_\_ corresponds to more than one different \_\_\_\_\_.

## set notation

Review each ordered pair. The relation will not be a function if any \_\_\_\_\_ corresponds to more than one different \_\_\_\_\_.

## graph

Use the \_\_\_\_\_. The relation will not be a function if a vertical line ever \_\_\_\_\_.

## mapping diagram

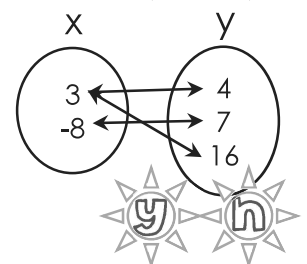
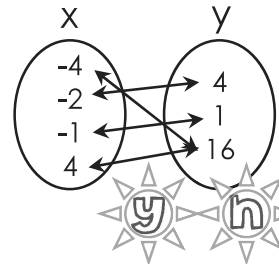
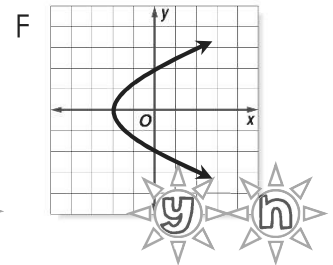
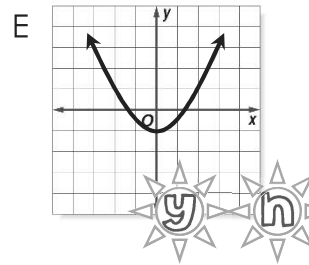
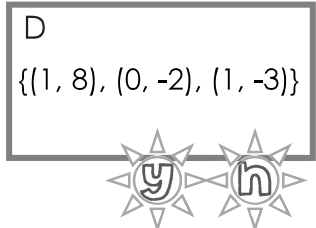
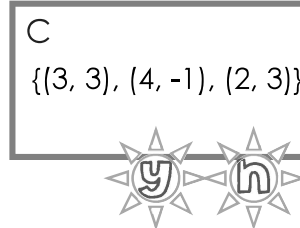
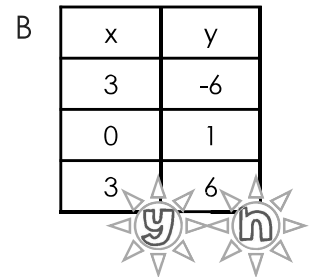
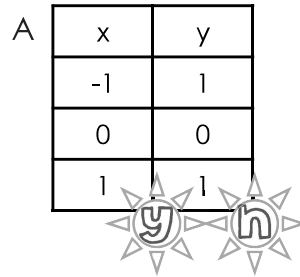
Review the arrows. The relation will not be a function if any \_\_\_\_\_ maps to more than one different \_\_\_\_\_.

## finding domain and range

The domain is the set of all possible \_\_\_\_\_.  
The range is the set of all possible \_\_\_\_\_.

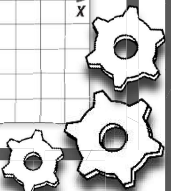
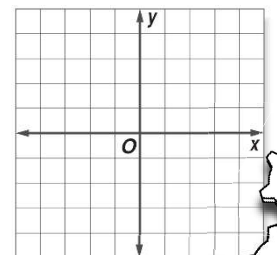
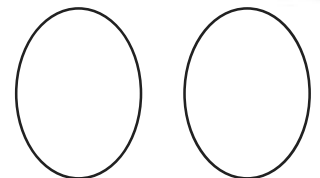
Identify the domain and range of the relations in the "table," "set notation," and "graph" examples above.

	Domain	Range
A		
B		
C		
D		
E		
F		



## Try it

Create a mapping diagram and a graph that each represent functions.



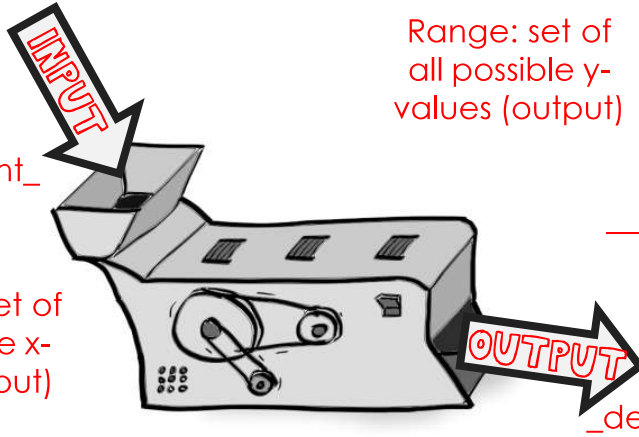
# the function machine

domain

x-values

independent

Domain: set of all possible x-values (input)



Range: set of all possible y-values (output)

range

y-values

dependent

A function is a

relationship

with one or more

variables

where each

input

has a single

output.

# functions

Each x-value is only allowed to correspond to ONE y-value!

This relation is a function because none of the input values (x-values) has more than one different output (y-value).

x	0	1	2	3	4
y	0	3	6	9	12

This relation is NOT a function because at least one of the input values (x-values) has more than one different output (y-value).

x	-3	2	-3	5	8
y	1	5	-1	2	-2

## notation

When dealing with functions, you will see f(x) in place of y.

How to say it out loud: " f of x "

## evaluating

To evaluate a function for a particular x-value, just substitute / plug it in and then simplify!

**Example:** If  $f(x) = 2x + 1$ , find  $f(3)$ .

Work:  $f(3) = 2(3) + 1$

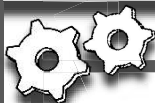
Answer: 7

When we put something IN,  
we can always expect a consistent result  
to come back OUT.



# determining whether a relation is a function

Add circles, arrows, lines, etc. to demonstrate why each relation is/isn't a function.



## table

Review the columns. The relation will not be a function if any x-value corresponds to more than one different y-value.

A

x	y
-1	1
0	0
1	1

B

x	y
3	-6
0	1
3	6

## set notation

Review each ordered pair. The relation will not be a function if any x-coordinate corresponds to more than one different y-coordinate.

C

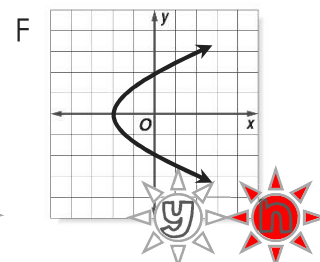
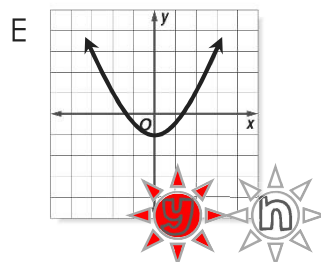
{(3, 3), (4, -1), (2, 3)}

D

{(1, 8), (0, -2), (1, -3)}

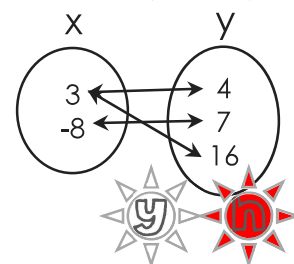
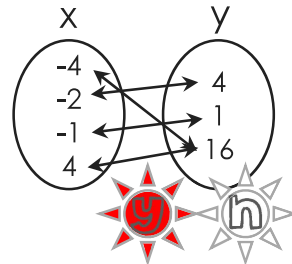
## graph

Use the Vertical Line Test. The relation will not be a function if a vertical line ever passes through more than one point.



## mapping diagram

Review the arrows. The relation will not be a function if any x-value maps to more than one different y-value.



## finding domain and range

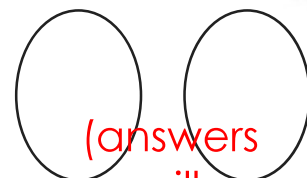
The domain is the set of all possible x-values.  
The range is the set of all possible y-values.

Identify the domain and range of the relations in the "table," "set notation," and "graph" examples above.

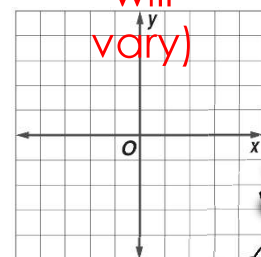
	Domain	Range
A	{-1, 0, 1}	{1, 0}
B	{3, 0}	{-6, 1, 6}
C	{3, 4, 2}	{3, -1}
D	{1, 0}	{8, -2, -3}
E	all real numbers $(-\infty, \infty)$	$[-1, \infty)$
F	$[-2, \infty)$	all real numbers $(-\infty, \infty)$

## Try it

Create a mapping diagram and a graph that each represent functions.



(answers will vary)



# Samples

**the function machine**

**DOMAIN**  
X-VAL. INDEPENDENT

**RANGE**  
Y-VAL. DEPENDENT

Range: the set of all possible y-values

Domain: Set of all possible x-values

A **function** is a relationship with one or more variables where each input has a single output.

## functions

Each x-value is only allowed to correspond to ONE y-value!

This relation is a function because none of the input values (x-values) has more than one different output (y-value).

x	0	1	2	3	4
y	0	3	6	9	12

This relation is NOT a function because at least one of the input values (x-values) has more than one different output (y-value).

x	-3	2	-3	5	8
y	1	5	-1	2	-2

**notation**

When dealing with functions, you will see  $f(x)$

How to say it out loud: "f of x"

**evaluate**

To evaluate a function for a particular value, just **PLUG IN** and then solve.

Example: If  $f(x) = 2x + 1$ , find  $f(3)$ .

Work:  $f(3) = 2(3) + 1 = 7$

Answer: 7

When we put something IN, we can always expect a consistent result to come back OUT.

For functions

Name: \_\_\_\_\_

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## determining whether a relation is a function

Add circles, arrows, lines, etc. to demonstrate why each relation is/isn't a function.

**table**

Review the columns. The relation will not be a function if any x-value corresponds to more than one different y-value.

A	x	y
	-1	1
	0	0
	1	1

Function

B	x	y
	3	-6
	0	1
	3	6

Not a function

**set notation**

Review each ordered pair. The relation will not be a function if any x-coordinate corresponds to more than one different y-coordinate.

C	(3, 3), (4, -1), (2, 3)
---	-------------------------

Function

D	(1, 8), (0, -2), (1, -3)
---	--------------------------

Not a function

**graph**

Use the **Vertical Line Test**. The relation will not be a function if a vertical line ever passes through more than one point.

E	Graph of a parabola opening upwards.
---	--------------------------------------

Function

F	Graph of a sideways parabola opening to the right.
---	--

Not a function

**mapping diagram**

Review the arrows. The relation will not be a function if any x-value maps to more than one different y-value.

G	x: -2, -1, 1, 4; y: 4, 1, 16
---	------------------------------

Function

H	x: 3, 4; y: 16, 16
---	--------------------

Not a function

**finding domain and range**

The **domain** is the set of all possible x-values.  
The **range** is the set of all possible y-values.

Identify the domain and range of the relations in the "table," "set notation," and "graph" examples above.

	Domain	Range
A	$\{-1, 0, 1\}$	$\{1, 0\}$
B	$\{3, 0\}$	$\{-6, 1, 6\}$
C	$\{3, 4, 2\}$	$\{3, -1\}$
D	$\{1, 0\}$	$\{8, -2, -3\}$
E	$(-\infty, \infty)$ all real numbers	$[1, \infty)$
F	$[2, \infty)$ all real numbers	$(-\infty, \infty)$ all real numbers

domain: x range: y

**Try it**

Create a mapping diagram and a graph that each represent functions.

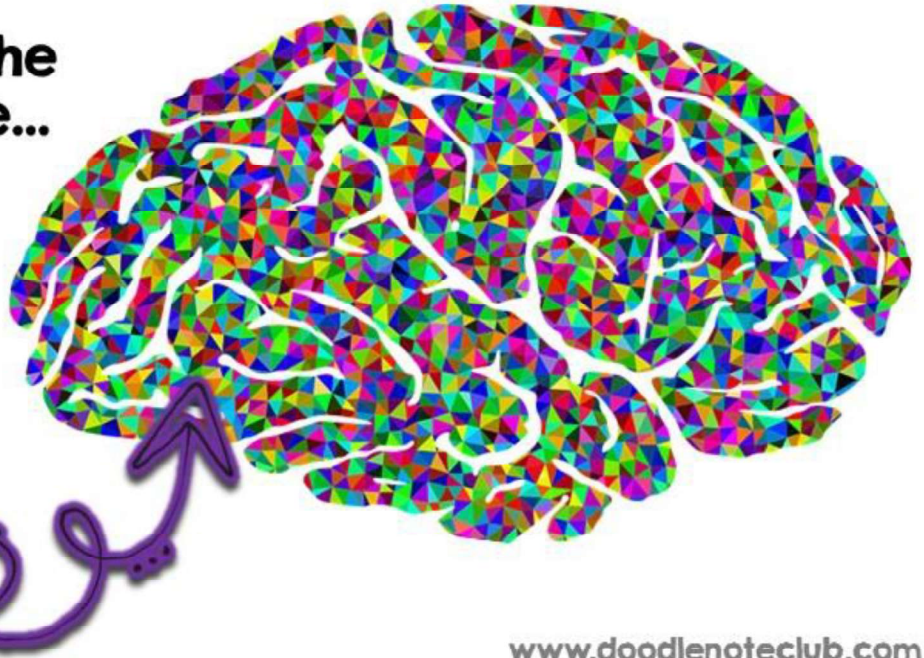
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# DOODLE NOTES

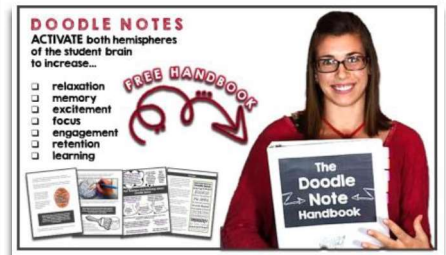
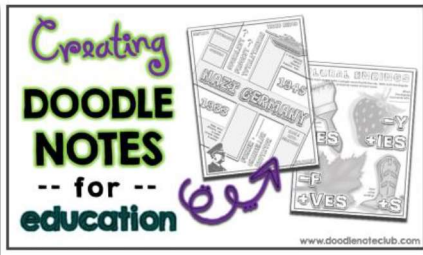
ACTIVATE both hemispheres of the brain to increase...

- relaxation
- memory
- excitement
- focus
- engagement
- retention
- learning



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