WHAT ARE FUNCTIONS?

RELATIONS, FUNCTIONS, VERTICAL TESTS, DOMAIN AND RANGE

INSPIRED BY mathspace

LESSON OUTLINE

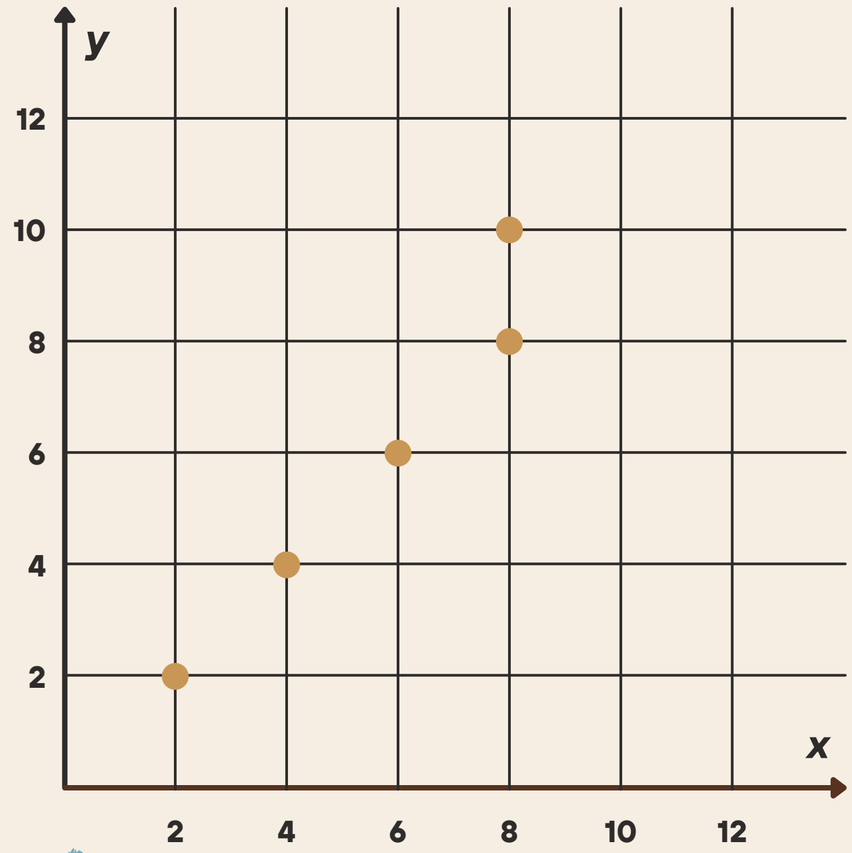
- What are relations?
- What are functions?
- Presenting functions as tables and graphs
- The Vertical Line Test

LET'S RECALL AND ANALYZE!

Do you still remember how to fill in the table of values based on a given graph?

Complete the table of values below.

x					
y					



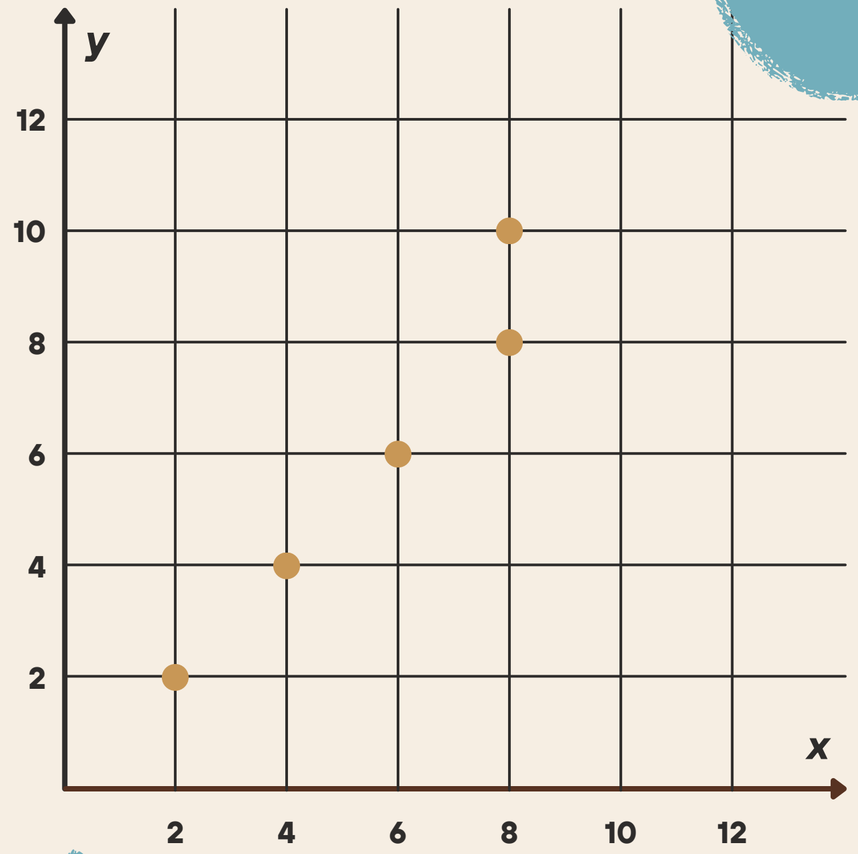
LET'S RECALL AND ANALYZE!

ANSWER KEY

Do you still remember how to fill in the table of values based on a given graph?

Complete the table of values below.

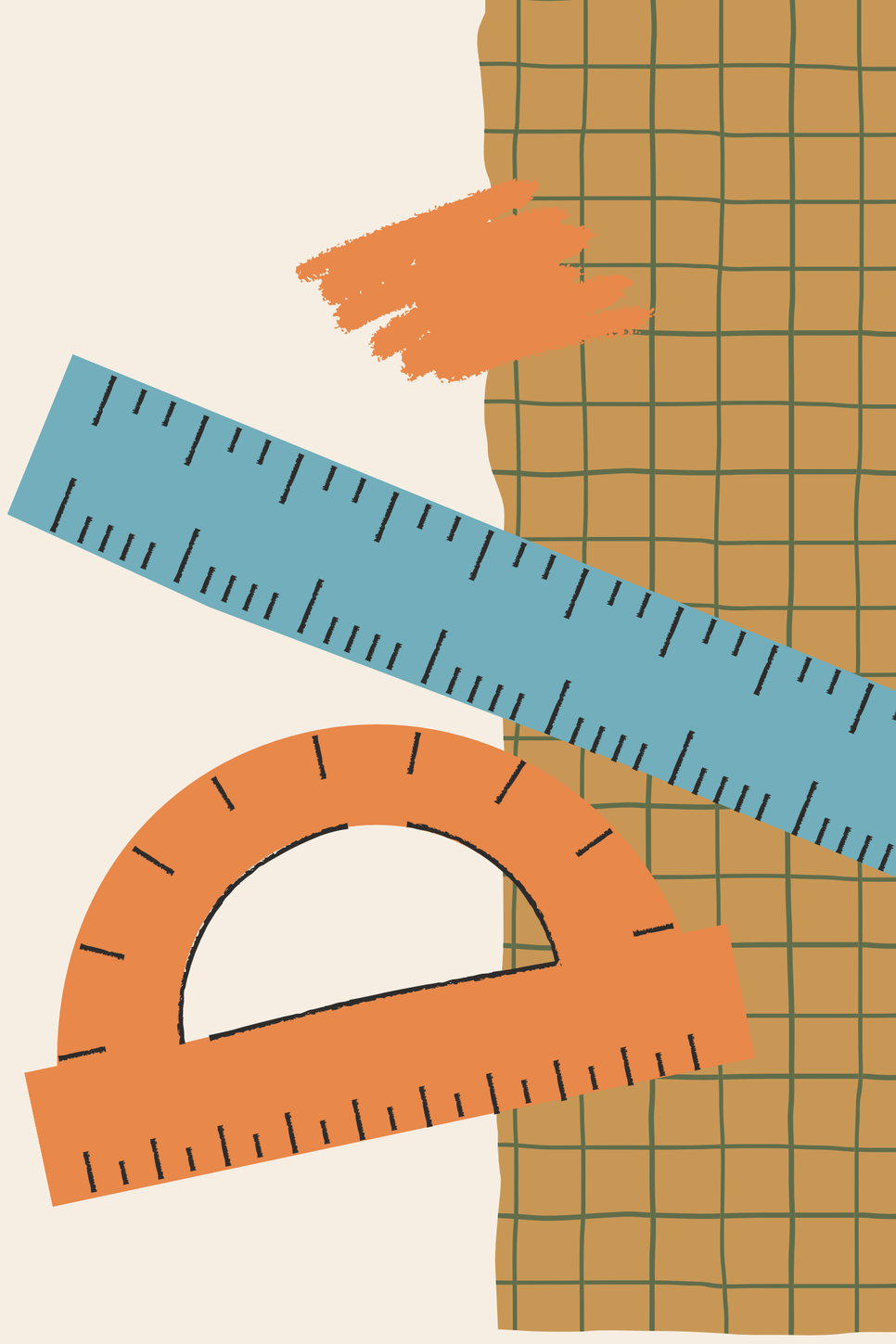
x	2	4	6	8	8
y	2	4	6	8	10



LEARNING OUTCOMES

By the end of the lesson, you'll be able to:

- Express relations and functions in tables and graphs.
- Differentiate between a relation and a function.
- Use a vertical test.



WHAT ARE RELATIONS?

A relation is a set of **ordered pairs** that represent a relationship.

Example:
Names and their age are a set of ordered pairs that we could put into a table.

Name	Alex	Jude	Arlo	Casey
Age	9	12	11	11

WHAT IS A FUNCTION?

- A function is a special type of relation where each **input only has one output.**
- Functions are a way of connecting **input** values to their corresponding **output** values.
- The relation is a function if, for every x-value, there is exactly **one y-value**.

WHAT IS A FUNCTION?

Functions are a way of connecting **input** values to their corresponding **output** values.

Example:
Ordering a coffee for $5

Pay $5, and you get 1 coffee.
Pay $10, and you'll get 2 coffees, and so on.

The input affects the output in a predictable way.

GRAPHING A FUNCTION USING THE TABLE OF VALUES

Given the equation **y = 2x.**

Step 1:

Construct the table of values.

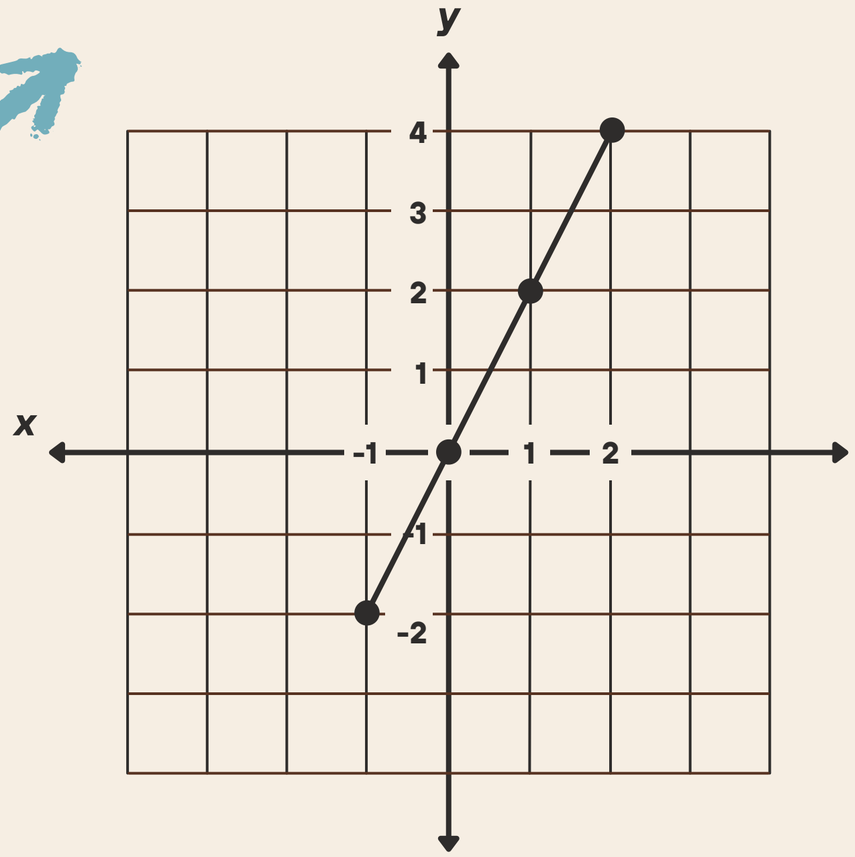
Do this by substituting values of x to y=2x.

x	-1	0	1	2
y	-2	0	2	4

Notice that for every value of x, there is only one value of y.

Step 2:

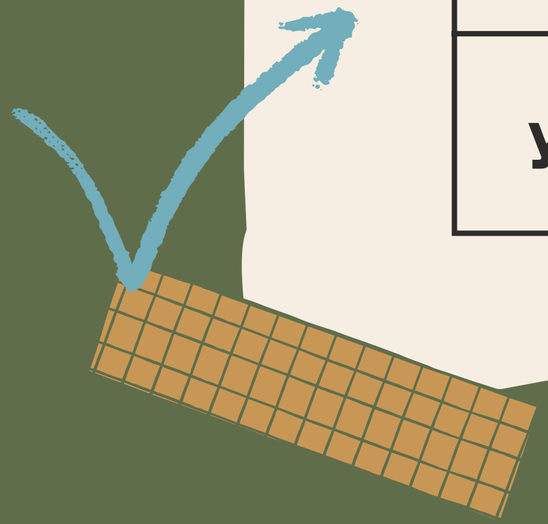
Plot the points.



TRY THIS!

Is this relation a function?

x	-6	-3	2	7	9	9	10
y	-18	-16	-15	-2	-4	11	-9



TRY THIS!

Is this relation a function?

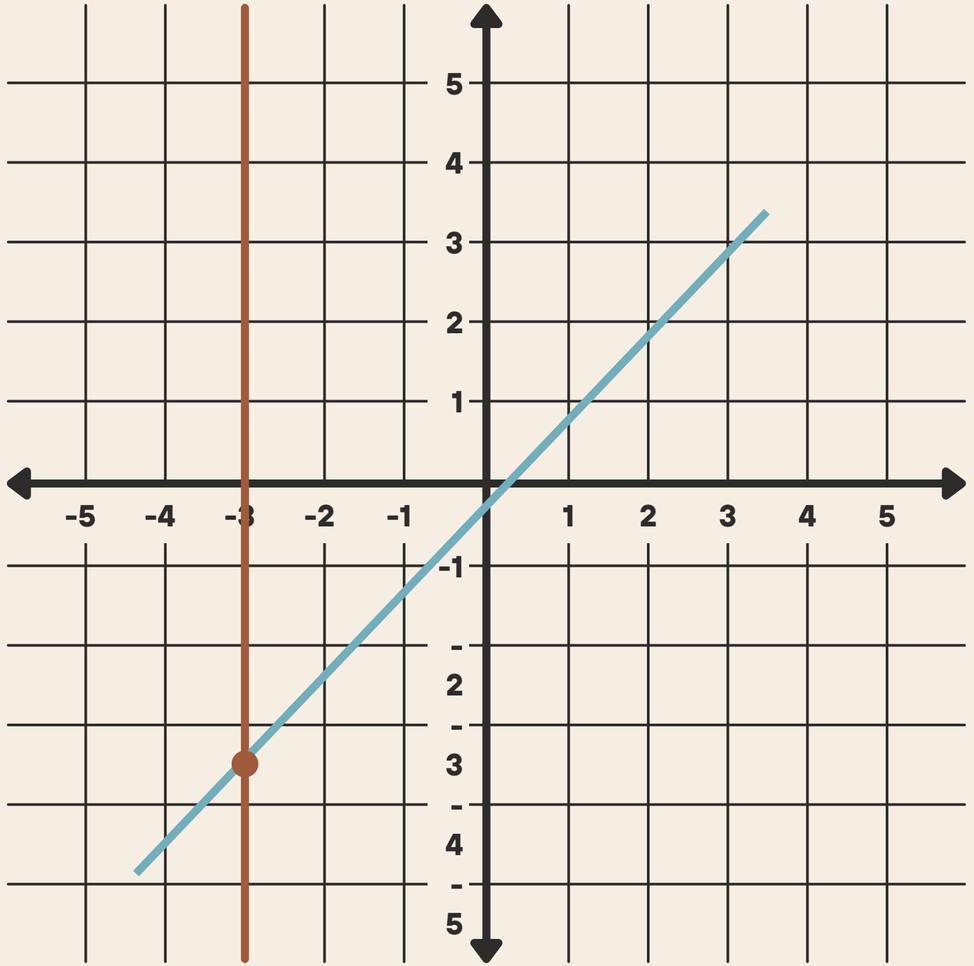
x	-6	-3	2	7	9	9	10
y	-18	-16	-15	-2	-4	11	-9

ANSWER: This is **not a function** because the x-value, 9, corresponds to two different y-values, -4 and 11.

VERTICAL LINE TEST

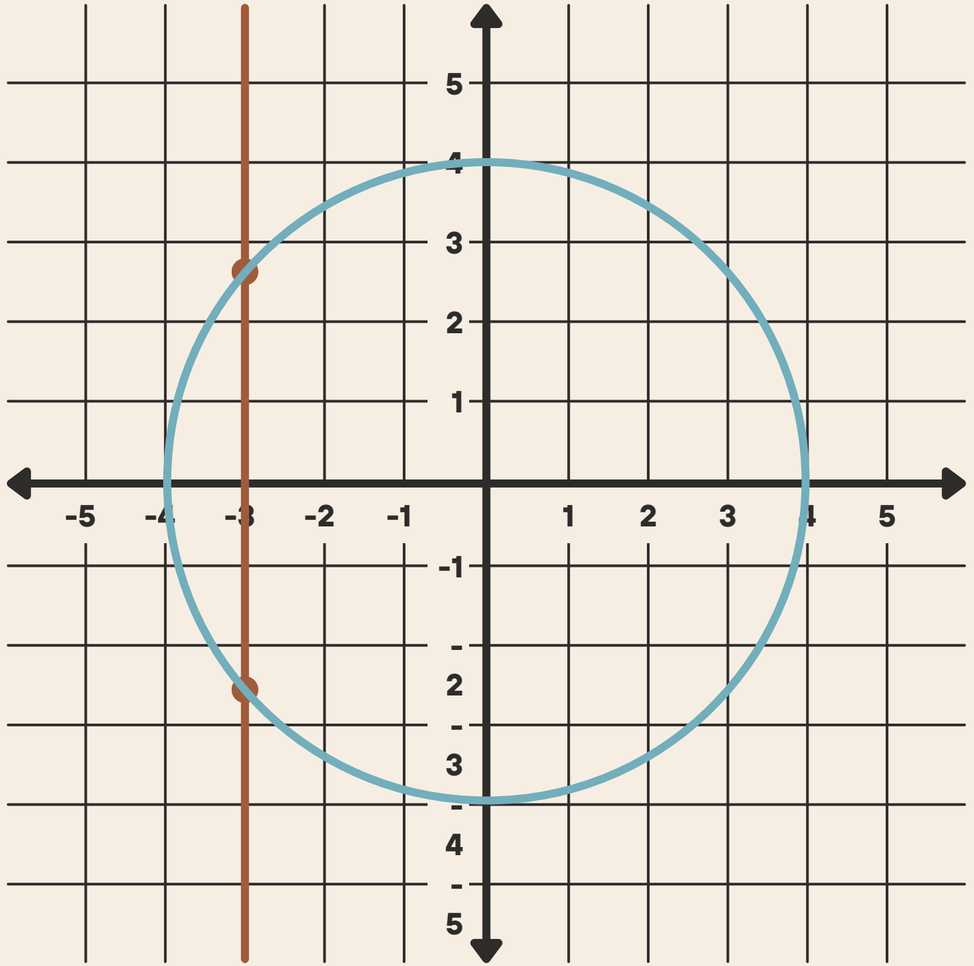
Use the vertical line test to check whether a graph of a relation is a function.

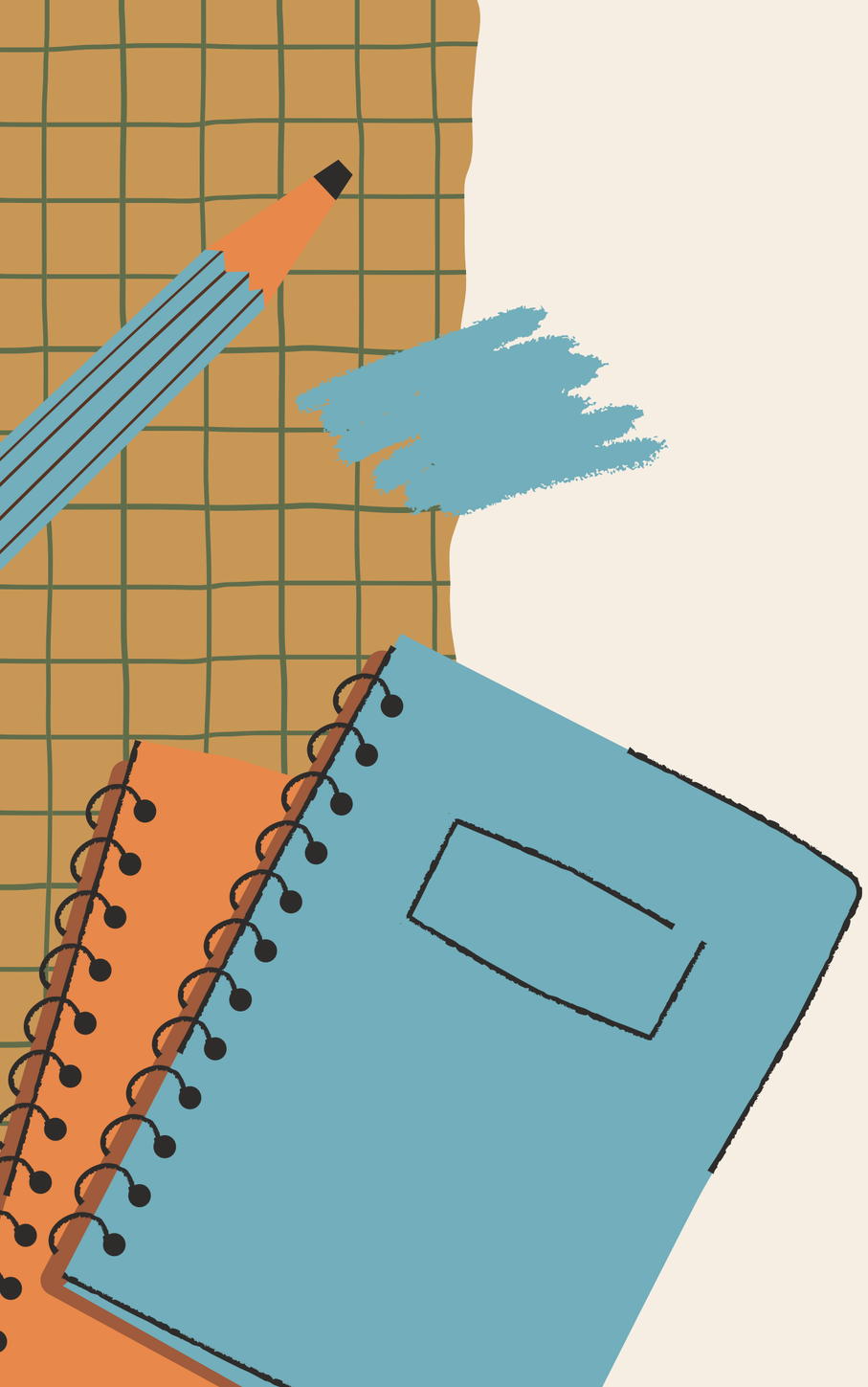
If a vertical line, drawn anywhere on the graph, can touch the graph only once, then it is a **function.**



VERTICAL LINE TEST

If a vertical line, drawn anywhere on the graph, can touch the graph more than once, then the relation is **not a function.**





SUMMARY

- A function is a special type of relation where each input only has one output.

- Graphing a function using the table of values

Step 1: Construct the table of values.

Step 2: Plot the points on the coordinate plane.

CLOSET COLORS!

Select 10 clothing items from your closet. Create a mapping diagram to record the colors to each of the clothing you have.

Then, find out if the information you collected represents a function or not.

Share your findings with the class next session.

REFERENCE

Mathspace. “6.0 Functions and relations | Grade 8 Math | Common Core 8 - 2023 Edition.” Accessed 12 June 2023, https://mathspace.co/textbooks/syllabuses/Syllabus-1157/topics/Topic-21908/subtopics/Subtopic-279918/?searchString=

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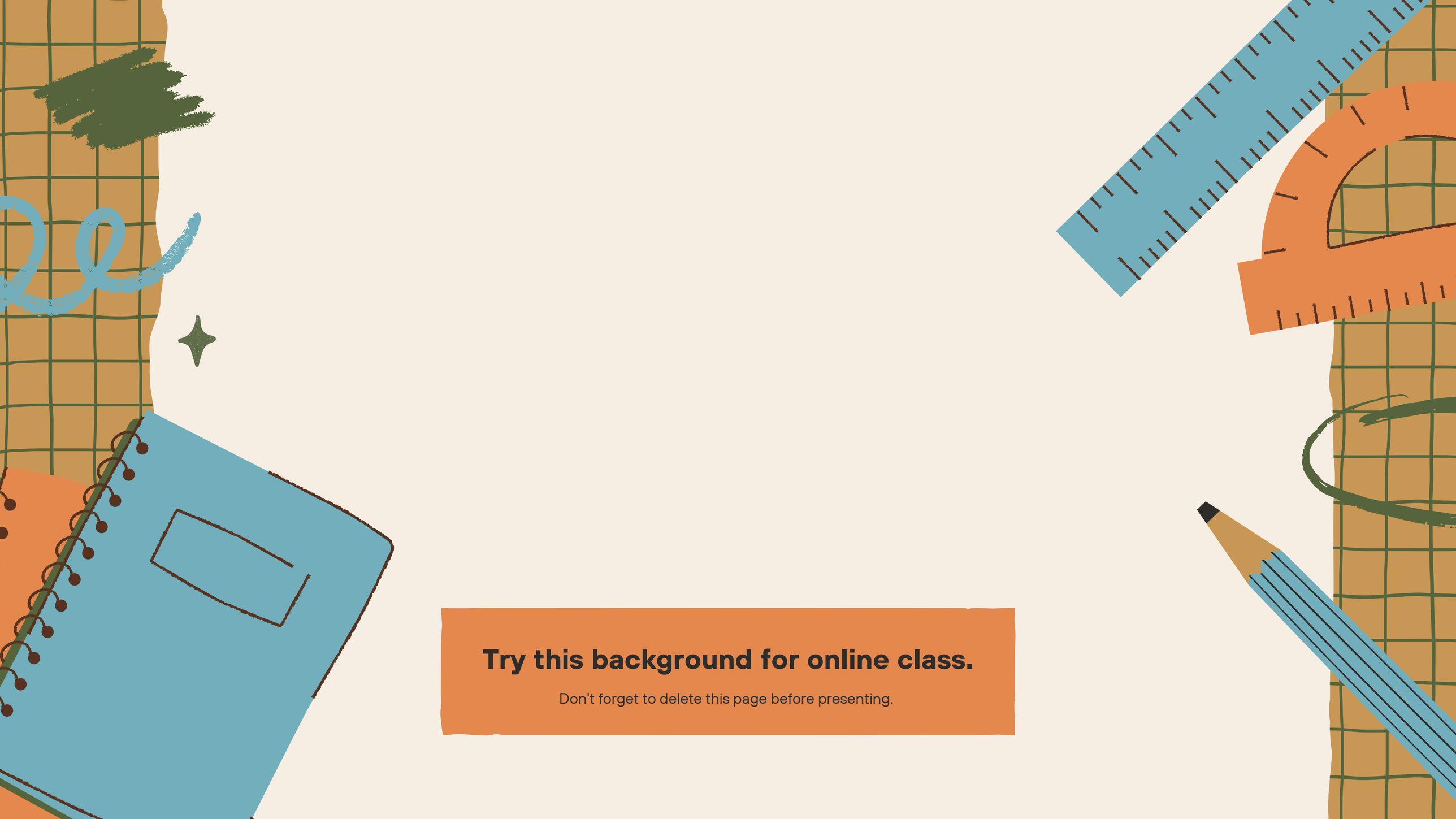

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PRESS THESE KEYS WHILE ON PRESENT MODE!

B	for blur
C	for confetti
D	for a drumroll
M	for mic drop
O	for bubbles
Q	for quiet
U	for unveil
0-9	Any number from 0-9 for a timer