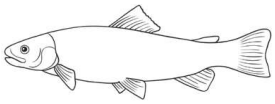
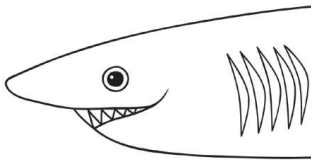
Names Class_____

DATA & TABLES

A collection of information.

Information organized in columns and rows.





- Collecting, organizing, and analyzing data is an integral part of doing science
- Data is a collection of information. There are two types of data: quantitative and qualitative
  - Quantitative data deals with quantity, or numbers, such as 12 oranges, 25 meters, 344 grams, or 100 degrees
  - Qualitative data deals with quality and is descriptive in nature such as blue-green in color, large in size, female in gender, or cold in temperature

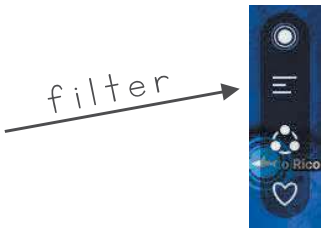
Put a square around the quantitative information and a circle around the qualitative information:

The male shark is of the species Great White and he is at a mature stage of life. He is 4 meters in length and 625 kilograms in weight. He was tagged off the coast of Madagascar, Africa. He has traveled a total of 12,800 meters since being tagged.

- A data table uses columns and rows to organize information about variables
  - A variable is a characteristic, number, or quantity that may change over time or in different circumstances.

TASK 1: DATA TABLE

1. Go to the Ocearch global shark tracker at www.ocearch.org
2. The map shows all of the recent pings of tagged animals.
3. Click the Filter button (three white lines) and choose the White Shark under the Species drop-down menu.



4. Click the blue Track button. Zoom out using the +/- buttons.
5. Click on one of the blue pings. On the right, you can view the name, photos, and data about this shark. You can X out of the pop-up to choose a different shark by clicking Close Track.
6. Choose at least 10 Great White sharks from the map and record their data on your Great White Data Table.

   You will need to convert pounds into kilograms ($1\ \text{lb} = 0.454\ \text{kg}$). Most of the sharks' lengths are given in both feet/inches and in meters (metric system). However, if you need to convert feet/inches to meters, **use 1 m = 3.28 ft.**
7. Additionally, mark each shark's approximate Latest Ping location on the World Map. Write the shark's name and date of Latest Ping (at top of pop-up box).
8. You may optionally choose 2 additional sharks.

Name _____ Class _____ Date _____

GREAT WHITE DATA TABLE

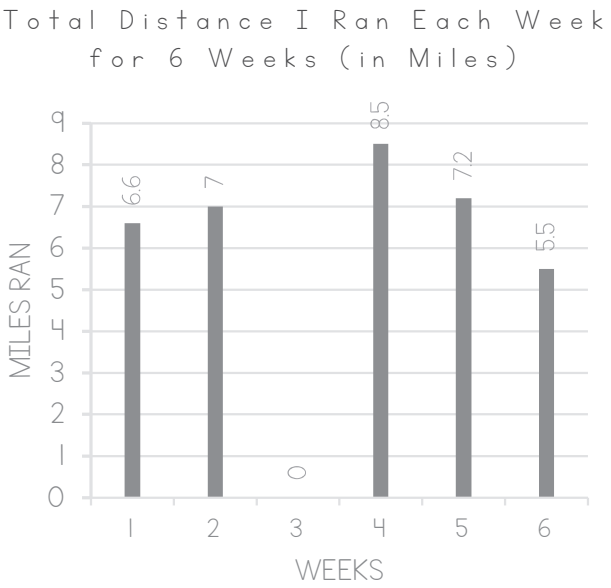
Name	Gender	Stage of Life	Length (ft/in)	Length (m)	Weight (lbs)	Weight (kgs)	Tag Location

BAR GRAPHS

- Bar graphs display data on X and Y axes

- Good for comparing quantitative data of experimental tests or how one variable affects another
- It is important to graph the correct variable on each axis:
  - The X axis should contain the independent variable, meaning that it stands alone and does not change due to the other variable
  - The Y axis should contain the dependent (or responding) variable, meaning that it may change with respect to the other variable

- As an example, if a bar graph was created to display the total distance that you ran each week over the course of 6 weeks, it may look something like this:



- The scale of a bar graph does not always need to start at 0. You want to maximize the space on the Y axis so that the difference between the bars is obvious

- It is important to put axis labels on a bar graph
  - *What is the label for the X axis? For the Y axis?*

- An outlier is a data point that seems abnormal compared to the rest of the data in a set
  - *What week would you consider to be an outlier in the graphed set of data?*

- The title of a bar graph should be descriptive

TASK 2: BAR GRAPH 1

1. Create a bar graph of the weights of the sharks from your Great White Data Table. Use the metric unit (kilograms). Color the female sharks' bars with one color and the male sharks' bars with another color. Make a small KEY to show the colors. Use graph paper to keep your graph neat. Make a 'rough draft' first.

2. Create a "good" copy of your bar graph.

3. Be sure to give your bar graph a title and axis labels.

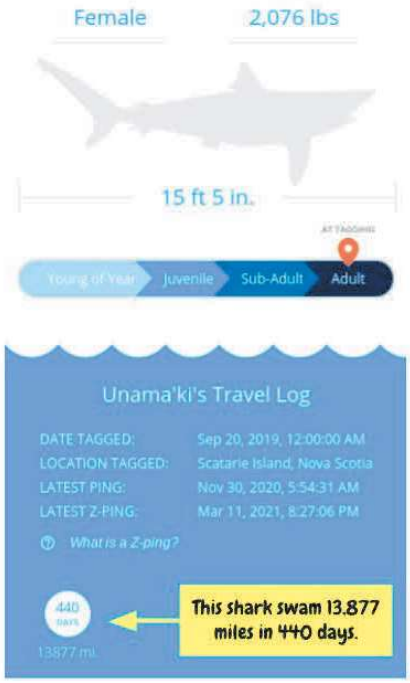
4. Label or write the name of this type of graph in the gray box at the top left of the booklet page.

5. In the bottom box, write a summary of what this type of graph is used for and a short analysis of what your graph's data shows about the sharks.

BAR GRAPHS (CONTINUED)

TASK 3: BAR GRAPH 2

1. Add data to the Great White Swim Speed Data Table. You will need to go back to Ocearch.org and use the filters to sort for each gender and age listed in the table. You will collect data on how far (in miles) a shark of that gender/age swam in a certain number of days. For example, the shark below swam 13,877 miles in 440 days. Divide 13,877 by 440 and you get 31.5 miles per day.



2. Create a bar graph of the different aged sharks' swim speeds (miles per day) from your Great White Shark Swim Speed Data Table. Color the female sharks' bars with one color and the male sharks' bars with another color. Make a small KEY to show the colors. Use graph paper to keep your graph neat. Make a 'rough draft' first.

3. Create a "good" copy of your bar graph.

4. Be sure to give your bar graph a title and axis labels.

5. Label or write the name of this type of graph in the gray box at the top left of the booklet page.

6. In the bottom box, write a summary of what this type of graph is used for and a short analysis of what your graph's data shows about the sharks.

Name _____ Class _____ Date_____

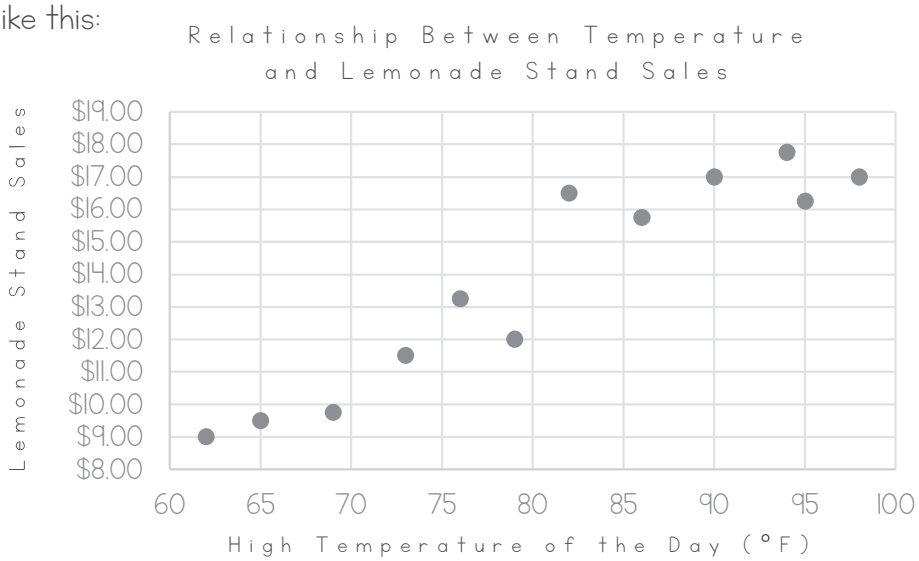
GREAT WHITE SWIM SPEED DATA TABLE

Gender	Stage of Life	Shark Name	Weight in Pounds	Miles Swam	# of Days	Swim Speed (miles ÷ days)
Female	Adult	Unama'ki	2076 lbs	13,877 miles	440 days	31.5 miles per day
Male	Adult					
Female	Sub-Adult					
Male	Sub-Adult					
Female	Juvenile					
Male	Juvenile					

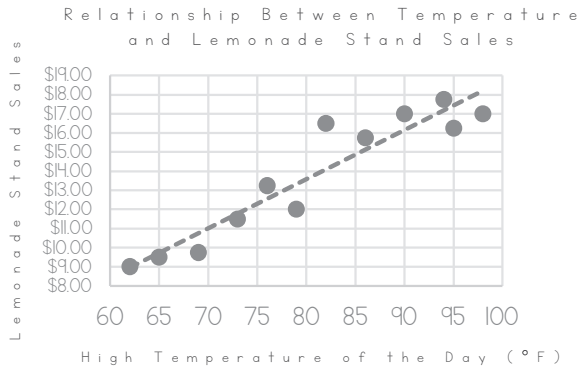
SCATTERPLOTS

- This is also called an X-Y plot

- Good for comparing the relationship between two sets of quantitative data
- Use dots as points and DO NOT connect the dots!
- As an example, if a scatterplot was created to display lemonade stand sales and the temperature of the day, it may look something like this:



- The scales of a scatterplot's axes should accommodate the best range of numbers to showcase the data
  - *What would this graph look like if the ranges on the X and Y axis began at '0'?*
- A trendline or 'best fit line' can be added to a scatterplot to show the general trend on the graph
  - To create a 'best fit line', use a ruler to estimate a straight line that cuts equally close to the data points (see example to the right)
  - *Why doesn't the trendline go through the intersection of the X and Y axes?*



- The title of a scatterplot should be descriptive

TASK 4: SCATTERPLOT

1. Create a scatterplot of the lengths and weights of the sharks from your Great White Data Table. Use the metric units (meters and kilograms). Put length on the X axis and weight on the Y axis. Draw a best fit line (trendline). Color the female sharks' points with one color and the male sharks' points with another color. Make a small KEY to show the colors, and then draw *two* different trendlines. Use graph paper to keep your graph neat. Make a 'rough draft' first.

2. Create a "good" copy of your scatterplot.

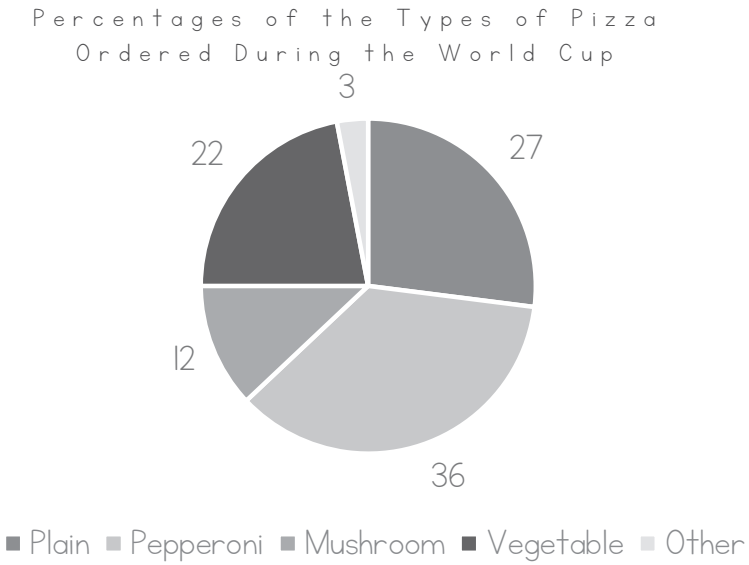
3. Be sure to give your scatterplot a title and axis labels.

4. Label or write the name of this type of graph in the gray box at the top left of the booklet page.

5. In the bottom box, write a summary of what this type of graph is used for and a short analysis of what your graph's data shows about the sharks.

PIE CHARTS

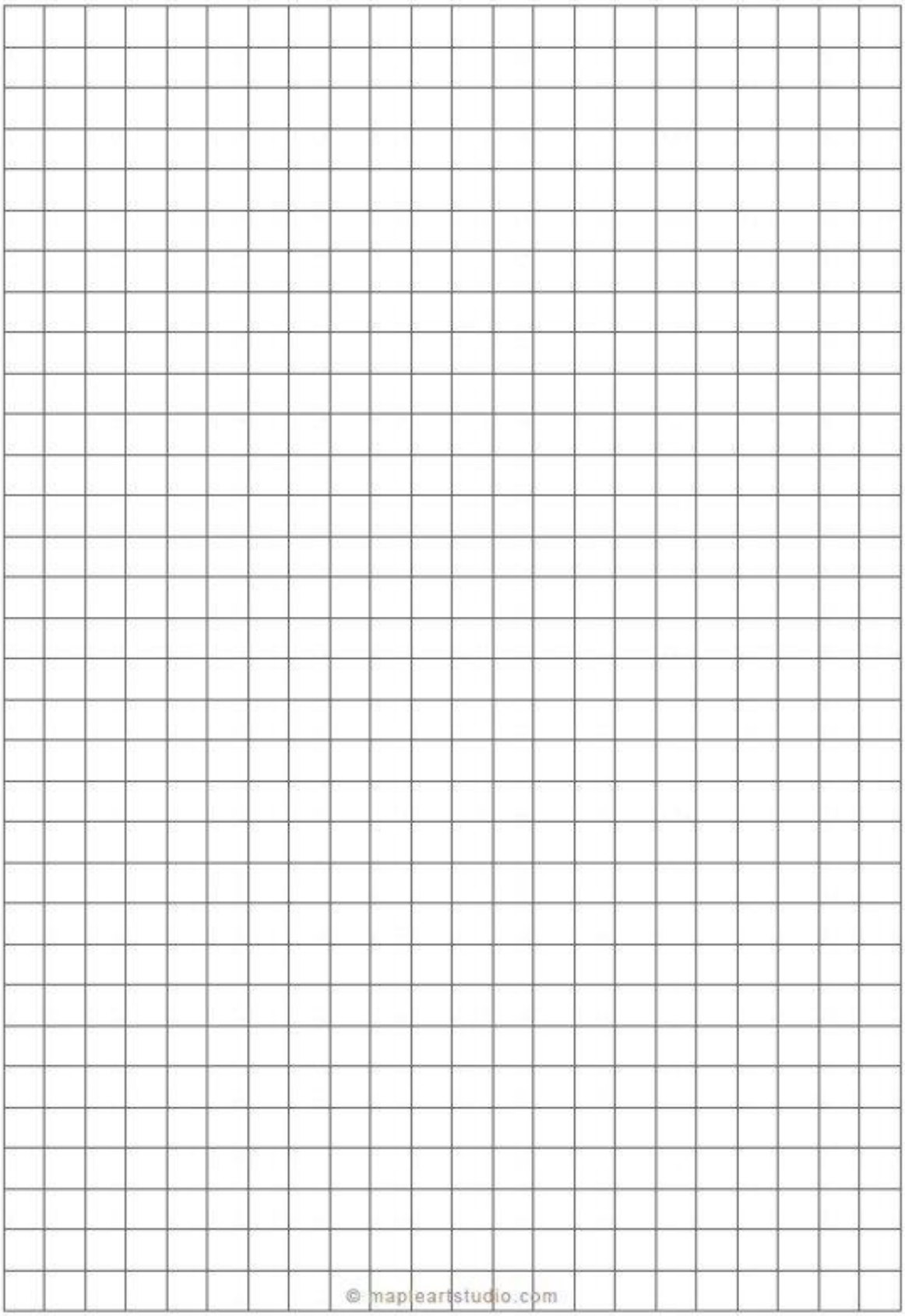
- This is also called a pie graph
- Good for showing percentages of a whole or percentages at a set point in time
- Pie charts do NOT show changes over time
- The sections of a pie chart should each be a different color or filled in with different patterns
- As an example, if a pie chart was created to display the percentages of the types of pizza that were ordered from Shark Bite Pizzeria during the World Cup, it may look something like this:



- If the pie chart shows percentages, they must add up to 100
- The actual percentages or parts can optionally be written by the pie slices
- The title of a pie chart should be descriptive

TASK 5: PIE CHART

1. Collect some new data from Ocearch to use to create a pie chart:
   Go back to the Ocearch global shark tracker at www.ocearch.org. Click the Filter button (three white lines) and choose the White Shark under the Species drop-down menu. Select **Adult** under Stage of Life and **Female** under Sex/Gender. Click the blue Track button. Zoom out using the +/- buttons if necessary to see all of the pings on the map.
2. Count the number of Adult Female Great Whites that show up as pings (blue dots) on the map. Record this number on the Gender and Stage of Life data table.
3. Now select **Adult** and **Male** and click Track. Count the number of Adult Male Great Whites. Record the number.
4. Do the same for **Sub-Adult Females**, **Sub-Adult Males, Juvenile Females**, and **Juvenile Males**. Record all numbers.
5. Calculate the total number of sharks that you counted. Then calculate the *fraction* of total and the *percentage* of total for each category of shark (row) on the data table. Decide on a color for each category of shark.
6. Create a pie chart using the percentage data. Make a 'rough draft' first.
7. Make a "good" copy of your pie chart.
8. Be sure to give your pie chart a title and a colored key.
9. Label or write the name of this type of graph in the gray box at the top left of the booklet page.
10. In the bottom box, write a summary of what this type of graph is used for and a short analysis of what your graph's data shows about the sharks.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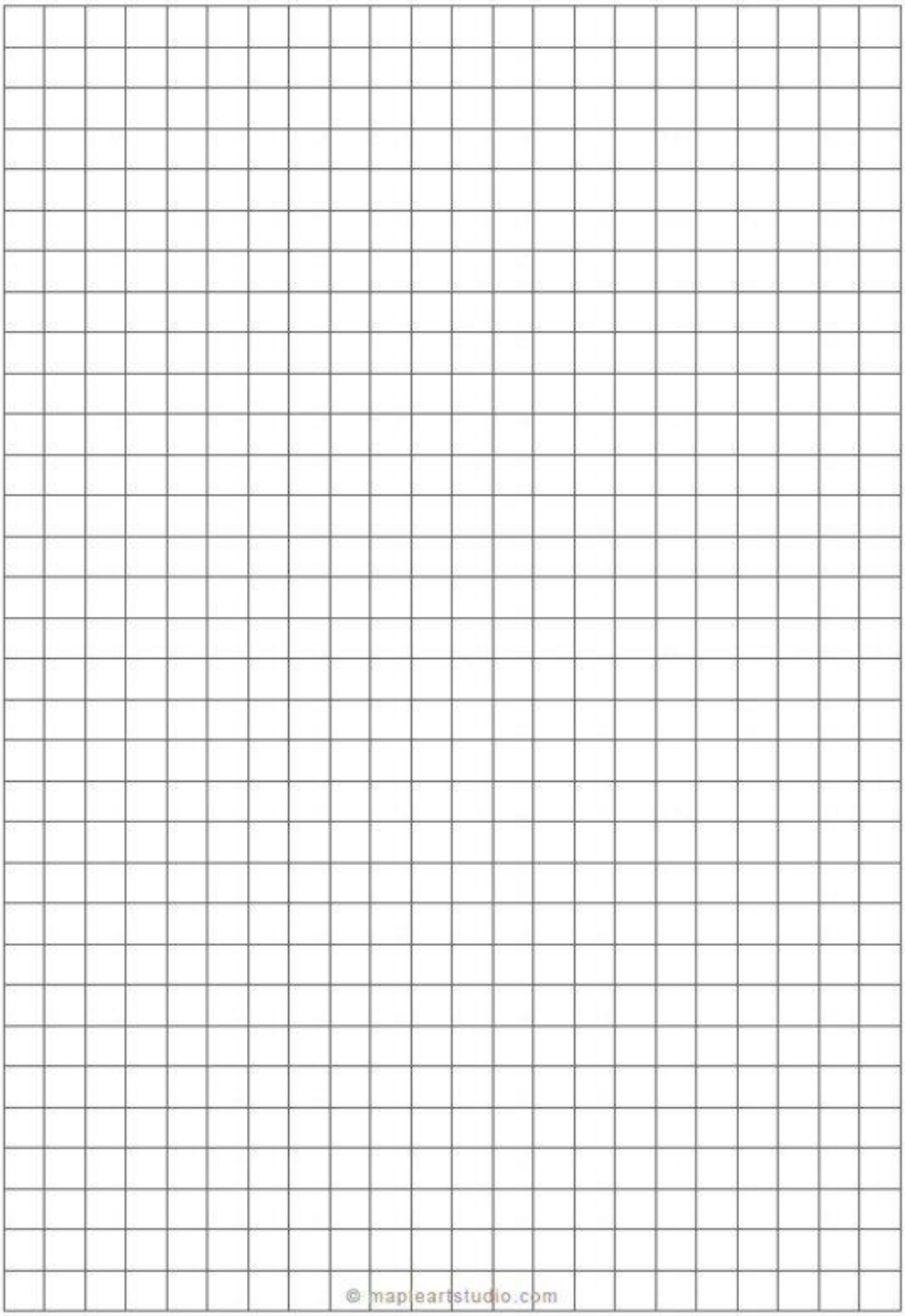
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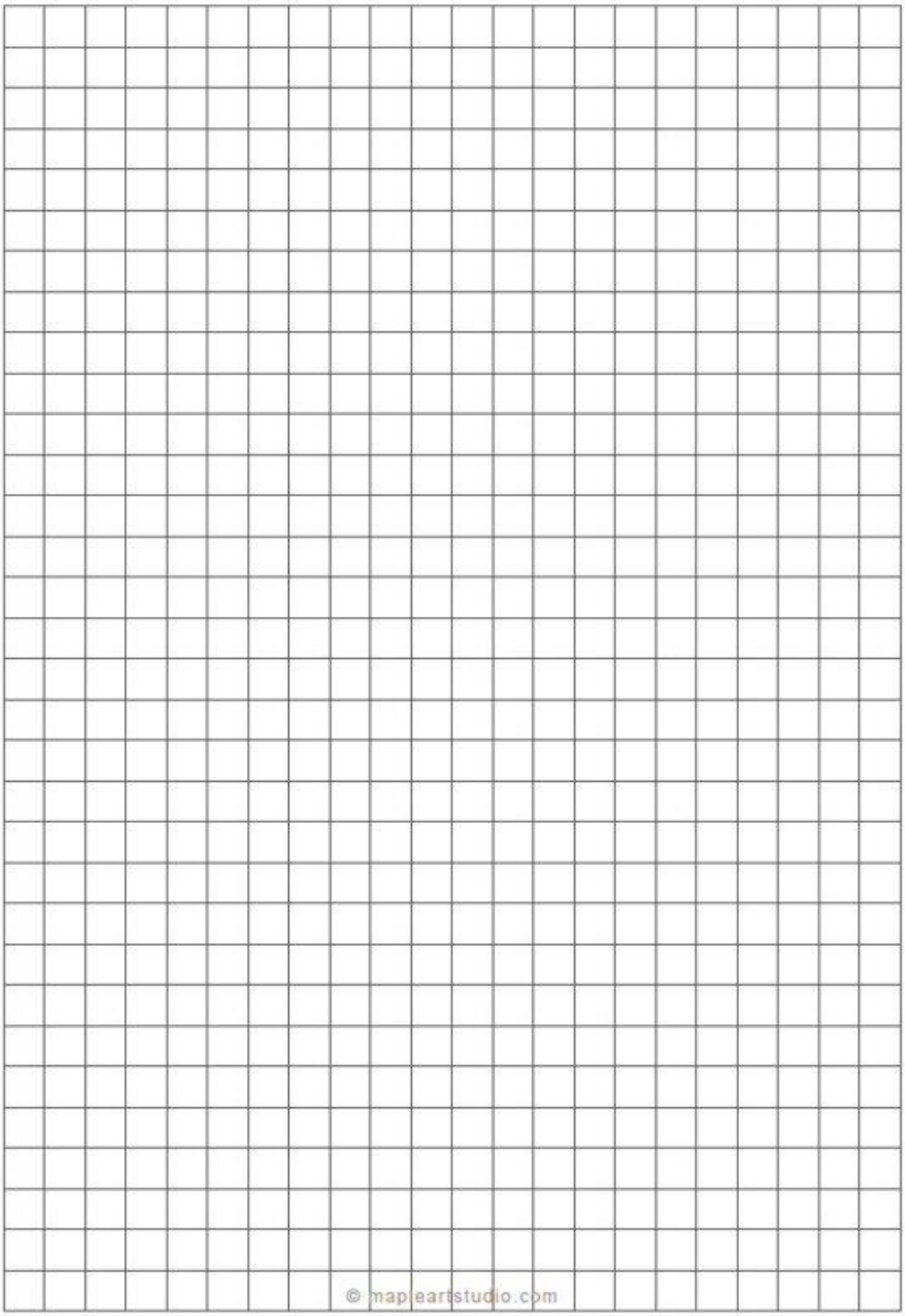
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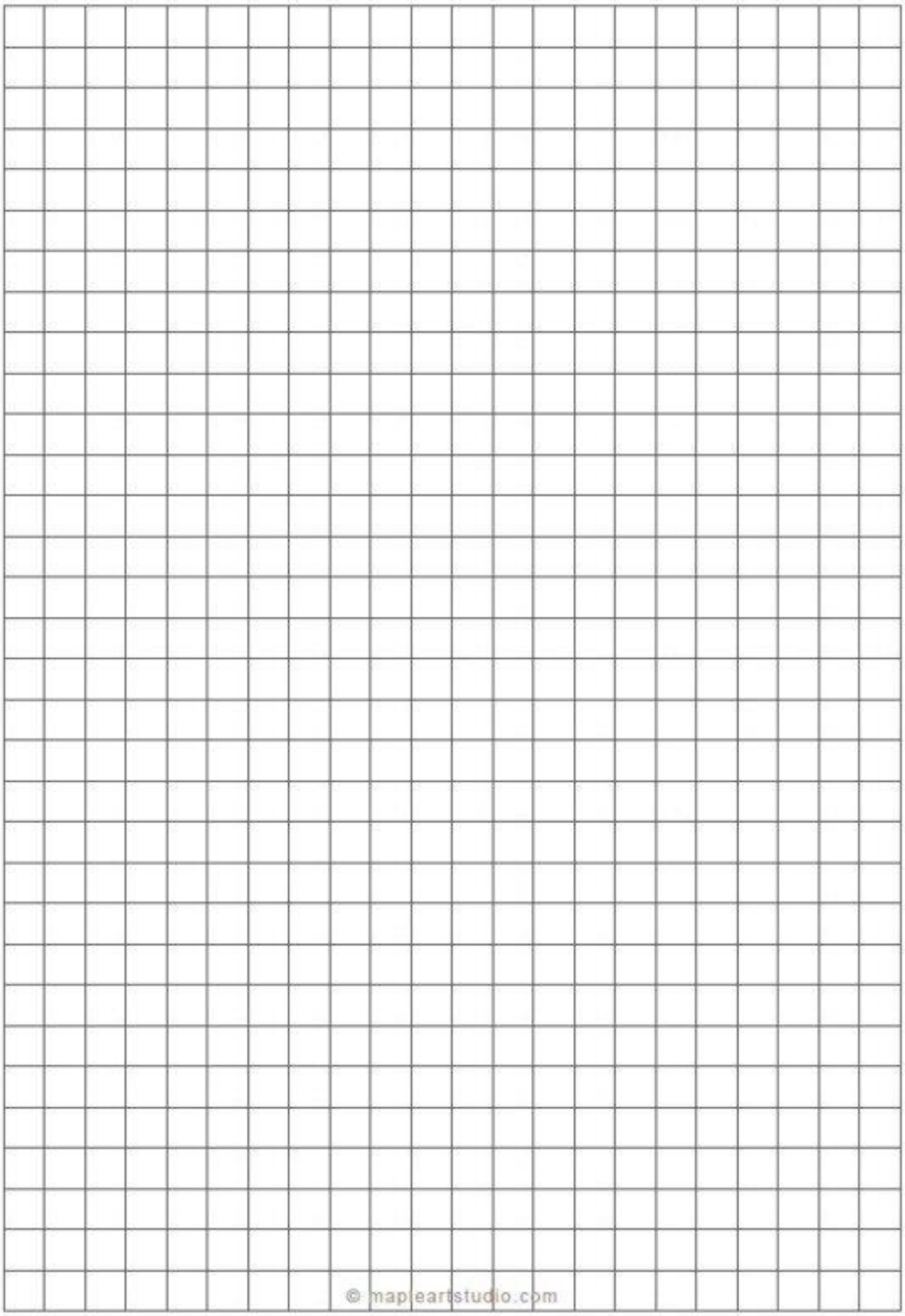
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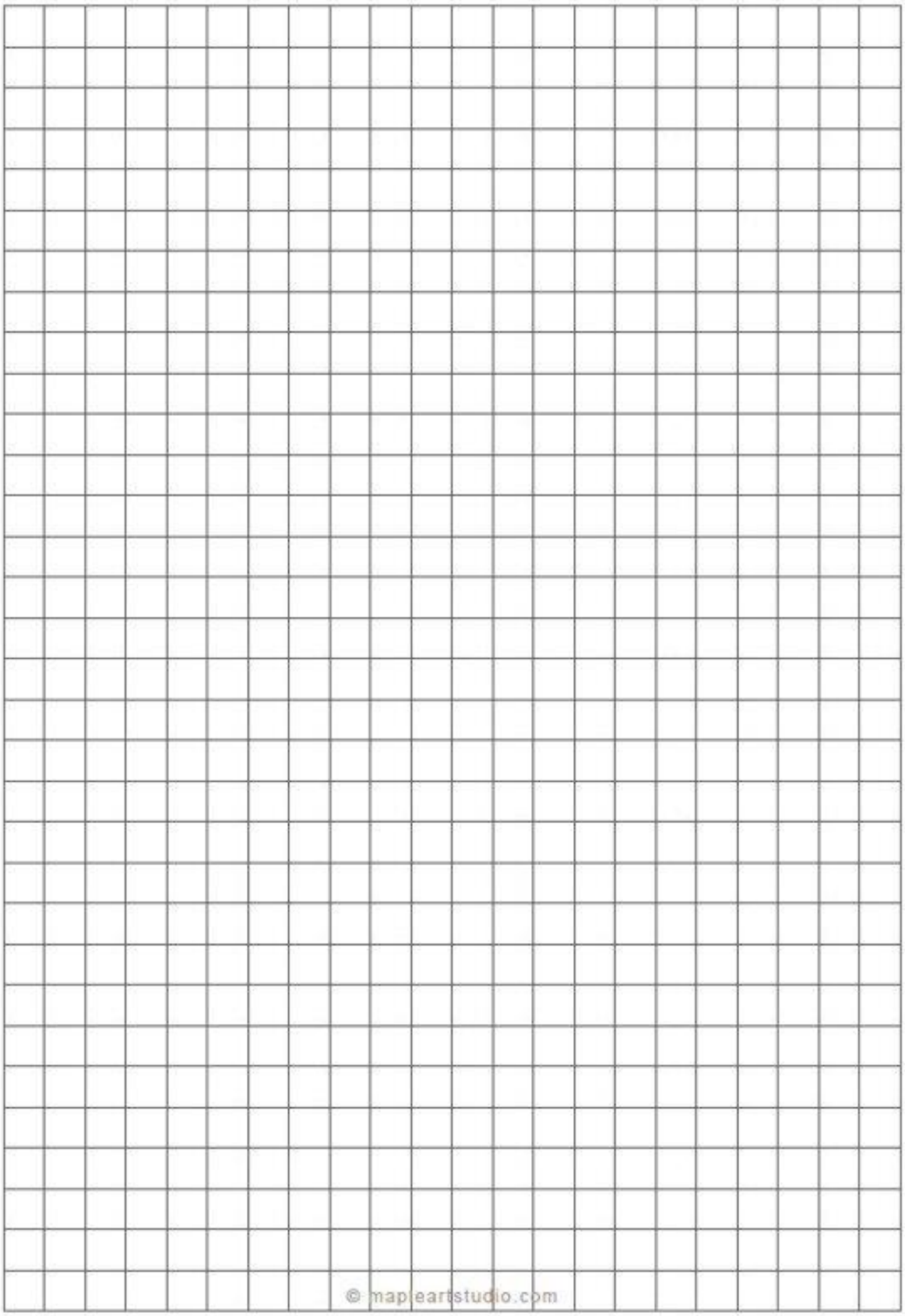
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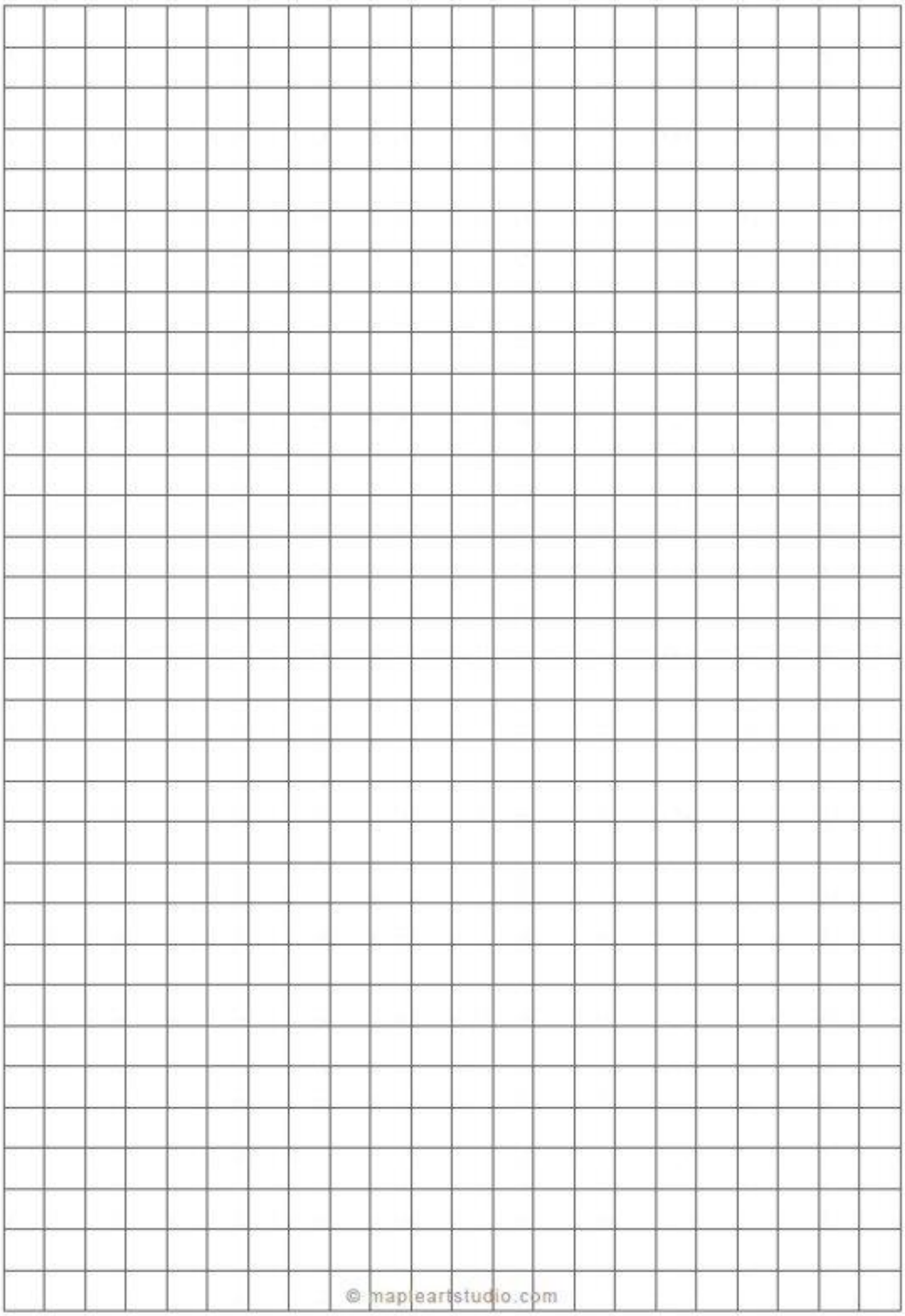
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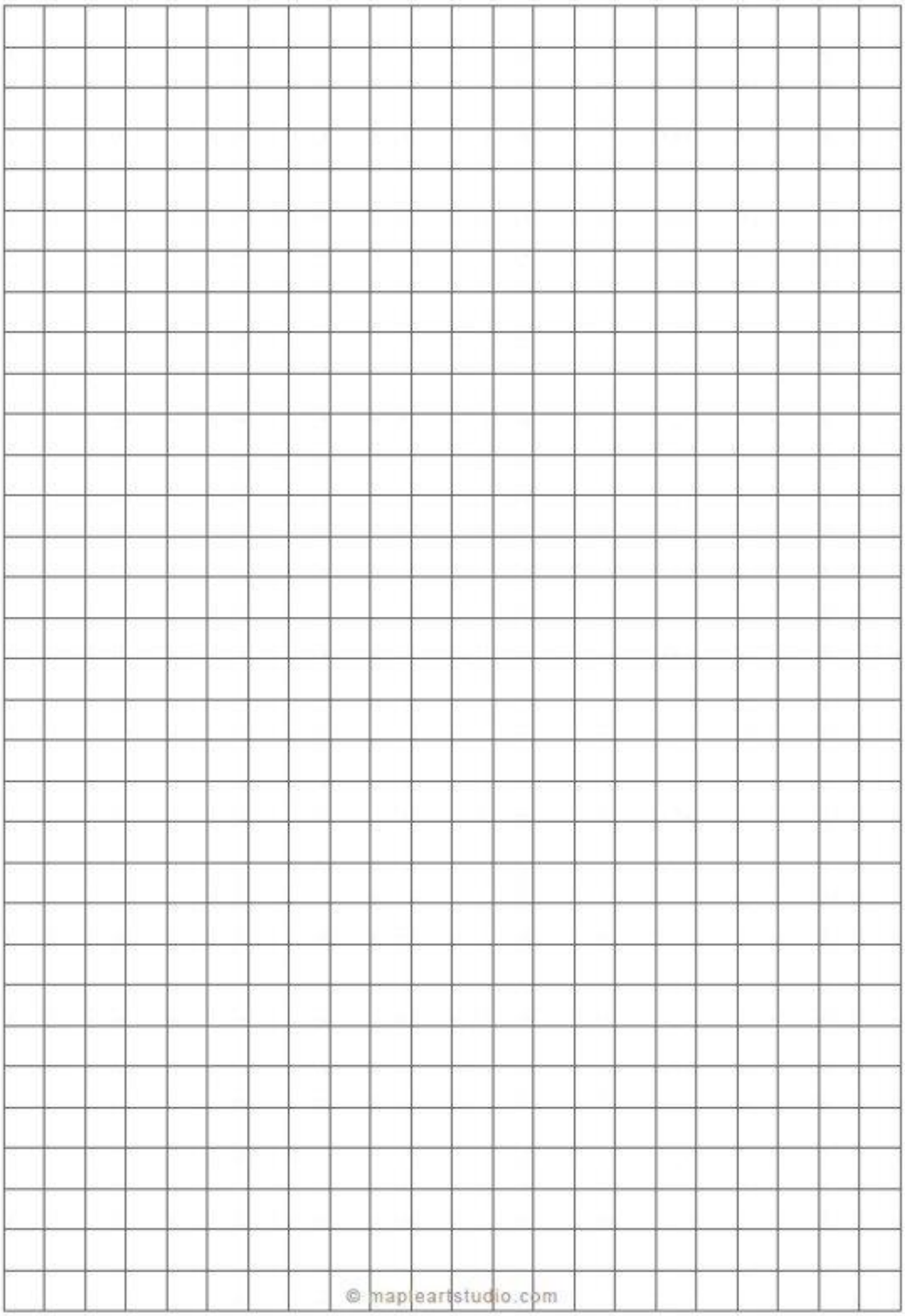
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