



Worksheet 2: Visualizing and Comparing Data

The data comes from Eurostat — the official statistical office of the European Union. It measures fresh water abstraction per capita, meaning how many cubic metres of fresh water (from rivers, lakes, and groundwater) each person uses per year on average.

You will compare two countries: North Macedonia and Estonia, from 2012 to 2023.

Part A — Read the Data

Open the "Eurostat Data" tab in the Excel file. Look at the numbers before touching Desmos.

1. What is the highest value for North Macedonia, and in which year?

Year: _____ Value: _____ m³ per person

2. What is the highest value for Estonia, and in which year?

Year: _____ Value: _____ m³ per person

3. Just from reading the numbers, which country uses more water per person overall?

4. Do you notice anything unusual or surprising in the numbers? Write it down:



Worksheet 2: Visualizing and Comparing Data

Part B — Build Your Visualization in Desmos

- **Step 1.** Open Desmos and create a new graph.
- **Step 2.** Create a table and enter the years (2012–2023) as your x-values.
- **Step 3.** Enter North Macedonia values as y-values and plot them as a line. Use blue.
- **Step 4.** Create a second table and enter Estonia values. Plot them as a second line. Use red.

Now answer:

1. What is the overall shape of the North Macedonia line is it going up, down, or does it jump around a lot?

2. What is the overall shape of the Estonia line?

3. Around 2019–2020, something interesting happens to both lines. What do you see and why might that be?

4. In 2023, the two lines seem to move in opposite directions. North Macedonia goes _____ while Estonia goes _____. What could explain this difference?



Worksheet 2: Visualizing and Comparing Data

Part C — Add a Regression Line

A regression line shows the general trend, smoothing out the jumps and drops.

- **Step 1.** In Desmos, generate a linear regression line.
- **Step 2.** Do the same for Estonia using a different variable name.
- **Step 3.** Note down the slope (m) that Desmos gives you for each country:
- North Macedonia slope: _____ Estonia slope: _____

Now answer:

1. A positive slope means the trend is going UP over time. A negative slope means it is going DOWN. What does each country's slope tell you?

North Macedonia trend: _____

Estonia trend: _____

2. Look at how well the regression line fits the actual data points. Does the line feel like a good summary of the data, or does it miss a lot? Why might a straight line not be perfect here?

3. If the current trend continues, use your regression line to predict water abstraction for each country in 2030:

North Macedonia 2030 prediction: _____ m³ per person Estonia 2030 prediction: _____ m³ per person



Worksheet 2: Visualizing and Comparing Data

Part D — Think Beyond the Numbers

1. Estonia has a population of about 1.4 million people. North Macedonia has about 2 million. Does knowing the population change how you interpret the data?

2. High water abstraction is not automatically bad — it depends on what the water is used for (farming, industry, drinking). What would you need to know to decide if a country is using too much water?

3. This data comes from Eurostat. Does knowing the source make you more or less confident in the data? Why?
