



# CLIMATE DETECTIVES 2021 – 2022



MindLab EDU GR Detectives 1  
MindLab Education Greece

## RESEARCH QUESTION

**How do scientists measure and record temperature in order to understand climate change in a specific area? Can we create our own weather stations?**

## SUMMARY OF PROJECT

We are an online STEAM & CODING class of 35 students from all over Greece. Temperature is the most common value in climatology and a very important variable in climate change. Our goal is to study and understand how scientists measure, record and process temperature. For this purpose every student created a meteorological station in the home with microbit and recorded the temperature in their area for a week.

Firstly we understood the difference between climate and weather and discussed climate change with the help of data and satellite imagery. Secondly we programmed the microcomputer microbit to record the temperature and performed a series of measurements to check its accuracy. Then we programmed microbit to record temperature every hour and placed it outside our home protected and away from heat sources so that we do not have errors in our measurements. After a week of measurements we collected our data and processed it to calculate the minimum, maximum and mean temperature values. Knowing now how scientists work, the data they need to collect and that our own measurements would not help us understand climate change, we took our project one step further. We collected the official mean temperature measurements for periods longer than 40 years and compared them with the average temperature of the last three years for a number of cities.



Figure 1: Cities where measurements and official data taken

## MAIN RESULTS

Creating a meteorological station that records the temperature using the microbit is something that helps us understand how scientists work. The appropriate time to record the temperature is every hour and all stations must record at the same time so that we can compare our measurements. The three quantities that are important to extract from our data are the minimum, maximum and mean temperature of each day. Sometimes the microbit records wrong temperature we must not use for our calculations, also comparing our measurements with the official ground observations we saw that our accuracy was + -1C.

From the comparison of the mean temperatures of the last 55 years with the corresponding ones of the last three years, we concluded that we have a small increase of the average temperature in all cities during most months of the year but mainly during the summer. Then calculating the difference between the temperatures for each city we saw that the northern cities of Greece (Alexandroupoli, Thessaloniki, Larisa) have a greater change in mean temperature change than the southern (Athens, Kalamata, Heraklion). Also the annual difference of the average temperatures ranged from 1.72 to 0.78 Celsius degrees .

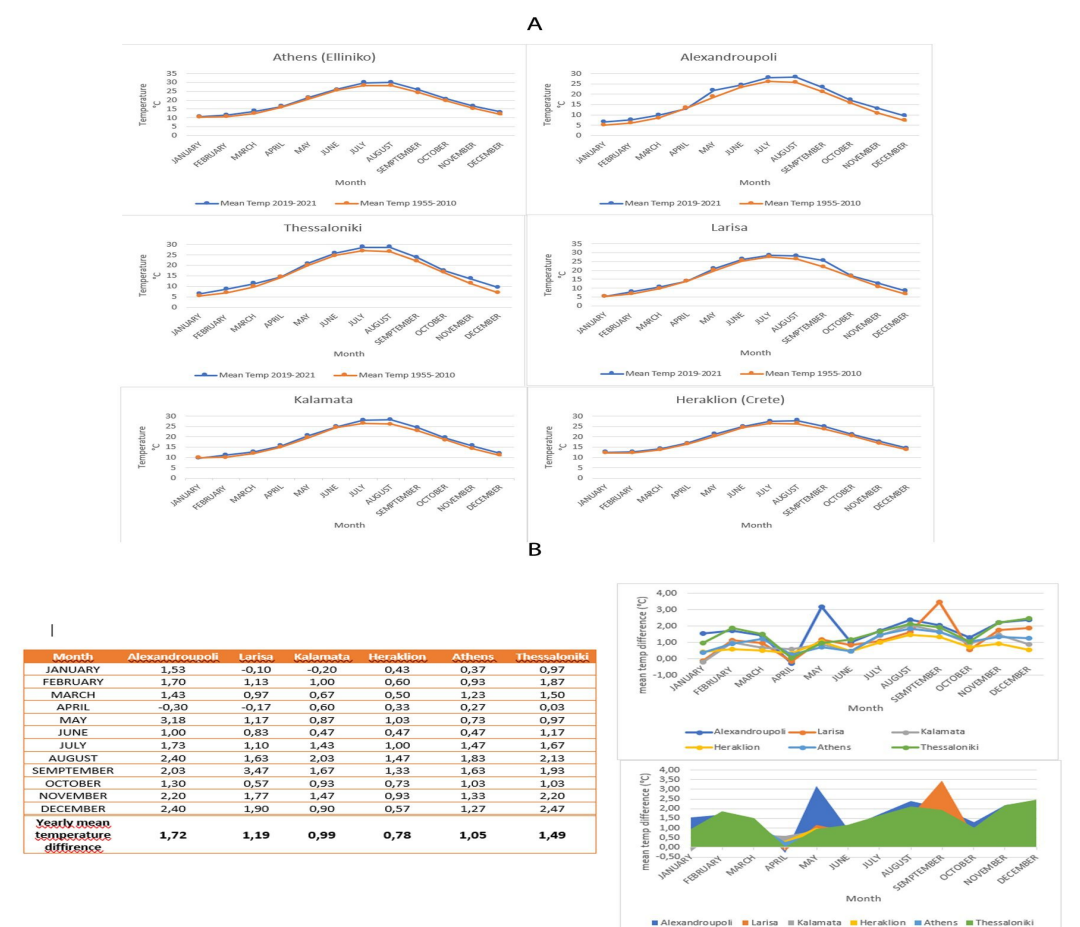


Figure 2: A. Past & Recent Mean Temperatures B. Mean Temperatures Difference

## ACTIONS TO HELP LESSEN TO THE PROBLEM

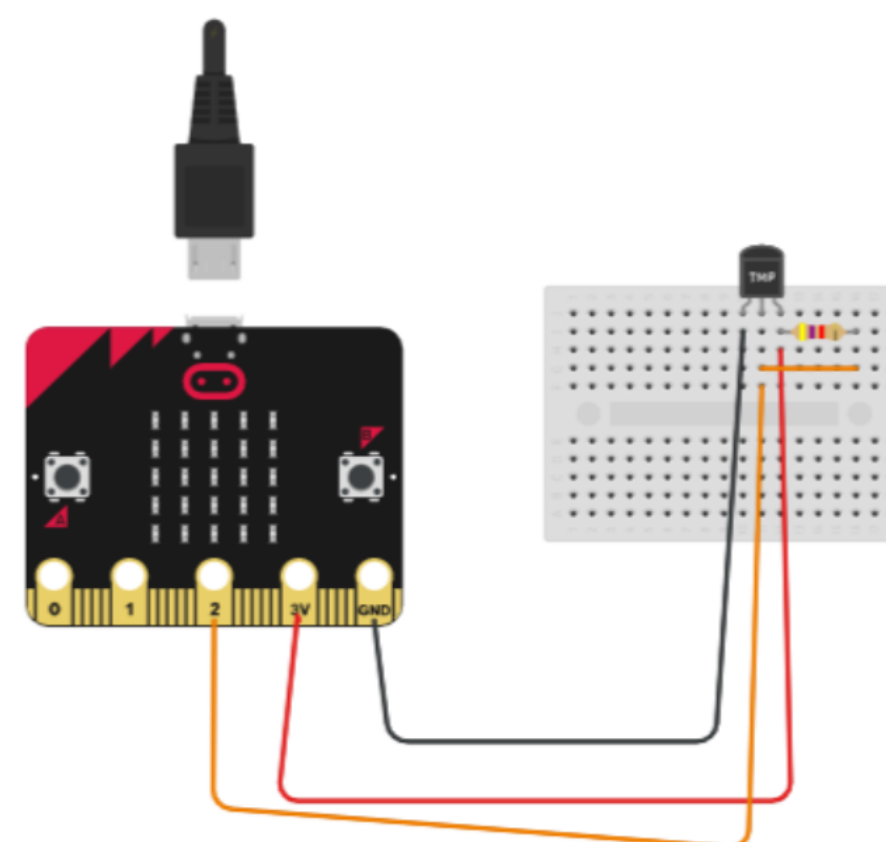


Figure 3: Students Micro:bit circuit

Climate change is a very complex issue that we all need to take into account. The first and most important thing is to raise awareness and gain knowledge about climate change. As we did for this project we could all be able to try to take measurements in our home town and see the impact of this phenomenon. We also aim to continue our project next year to deepen our knowledge.