Year 8 Science: Earth - Climate Change

**LESSON OBJECTIVES:**

* Understand the causes and effects of climate change.
* Analyse data related to climate change, such as temperature, carbon dioxide levels, and sea levels.
* Discuss personal and collective actions to reduce carbon footprints.

**Introduction:**

In this lesson, you will explore the impacts of climate change by examining data on global temperatures and greenhouse gas emissions. You will use Python to analyse this data and draw conclusions about how our planet is changing.

# Setting Up

There are two online places where you can access these sessions. The first one is for if you can use a google email, please ask your teacher. Otherwise JupyterLab can be used.

## With A Google Email: Google Colab

**Go to this link:**

* [Google Colab Notebook](https://colab.research.google.com/drive/1fSbrd54814vMdQjYW9t-Xh45BwYSwMI1#scrollTo=_5_-jns1oDwC).

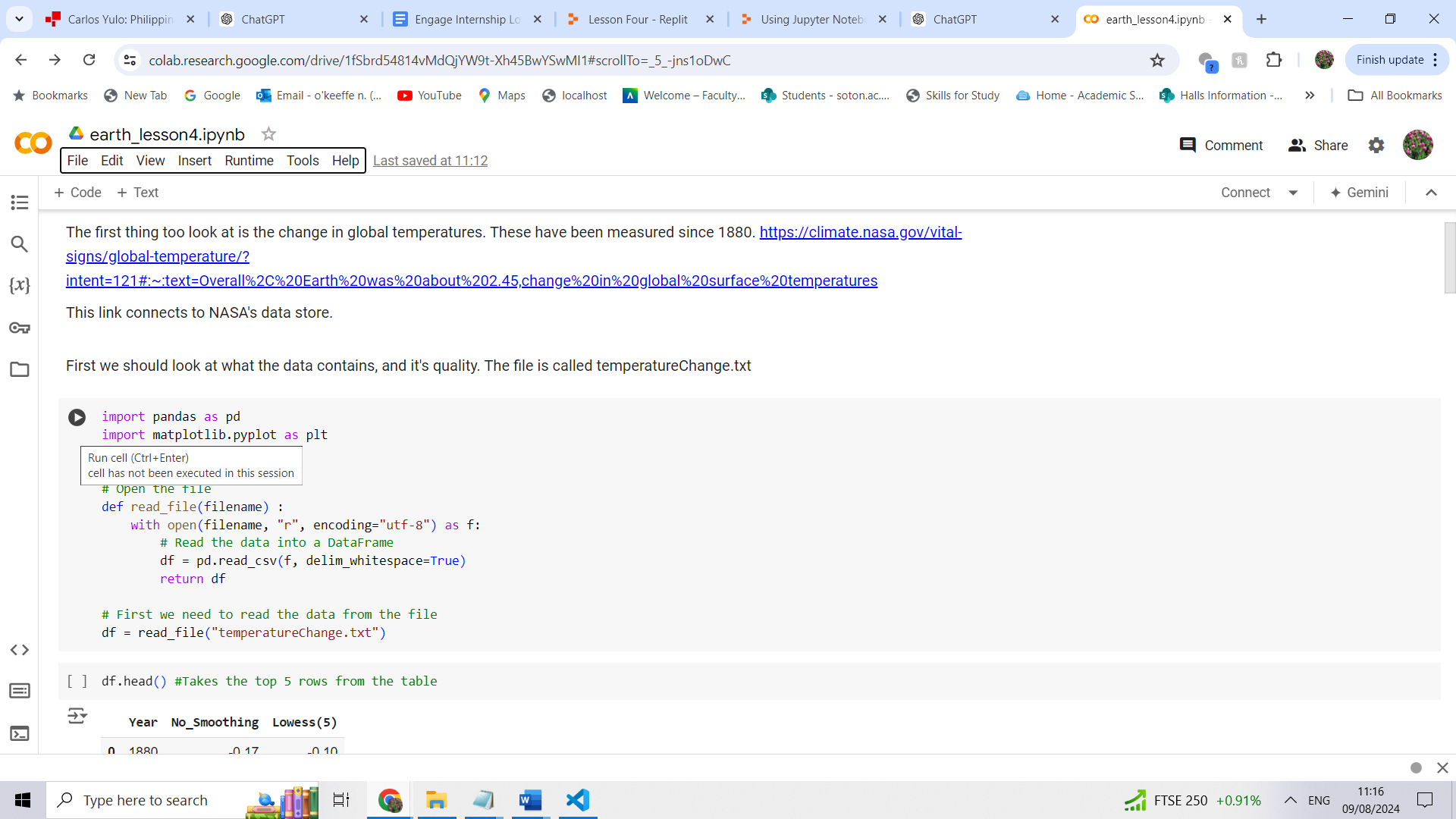
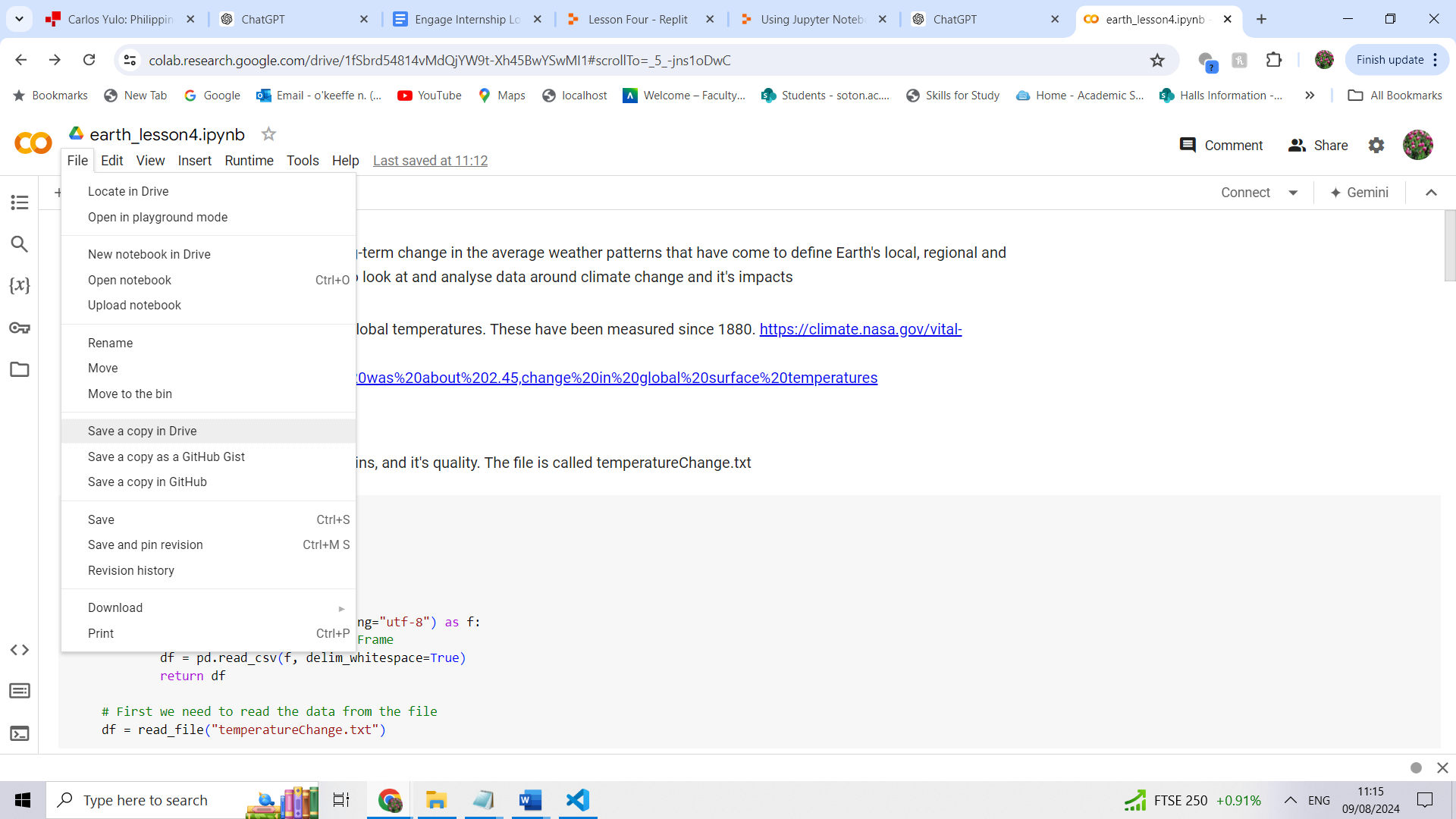
**Save a copy to your Google Drive:**

* Click on "File" in the top left corner.
* Select "Save a copy in Drive."
* This will create your own copy of the document where you can make changes.

**Running the code:**

* Each grey box contains code. To run the code, click the "Run" button (it looks like a play button) in the top left of the grey box.
* **Important:** Run the boxes in order, starting from the top. If you skip a box or run them out of order, you might see an error message.

**If you are stuck look through the code walkthrough document.**



## Jupyter Lab

**Opening the Notebook:**

* Launch JupyterLab on your computer or through <https://jupyter.org/try-jupyter/lab/>
* Upload the engage\_lesson4.ipynb to the website
* Double-click on the notebook file to open it.

**Running the Code:**

* The notebook contains cells, which are the grey boxes with code or text.
* To run a cell, select it by clicking on it, and then click the "Run" button (which looks like a play button ▶️) in the toolbar at the top.
* You can also run a cell by pressing Shift + Enter on your keyboard.

**Important:**

* Ensure you run the cells in sequential order, starting from the top. Running them out of order or skipping cells may lead to errors.
* If a cell takes time to run, be patient and wait for it to finish before moving on to the next one.

**Troubleshooting:**

* If you encounter any issues or get stuck, refer to the provided code walkthrough or help documentation for guidance.

# Section 1: Understanding Global Temperature Changes

How do you view the first five rows of a table in Python?

What does the describe() method show?

What has happened to global temperatures since 1880?

What do you expect will happen to global temperatures in the next 50 years?

# Section 2: Greenhouse Gas Emissions by Country

What five countries release the most amount of green house gases?

Why might these countries produce more?

Draw a diagram of the chart

Compare the chart from Section 2 and the data from Section 1 – what does it show? What’s different?

# Additional Activities:

Create a chart for sea level data.

Hint: Re-use the code from section one.