Activity Sheet: Temperature and Altitude Analysis using Stratospheric Balloon Data

Objectives

1. Analyse and interpret temperature data collected by stratospheric balloons in Toulouse and Kiruna.
2. Create clear and accurate graphs showing the relationship between temperature and altitude.
3. Compare experimental results with theoretical expectations and draw conclusions.
4. Present findings on a poster and explain their relevance to climate change studies.

Instructions

Part 1: Data Analysis and Graph Creation

1. Open the dataset provided (stratospheric balloon data for Toulouse and Kiruna).
2. Using LibreOffice Calc, create a **temperature vs. altitude graph** for each location.
    - Use the annex for guidance on how to create a clear and professional graph.
    - Ensure both graphs use consistent scales and labels for easy comparison.
3. Compare the graphs:
    - Identify trends and differences between Toulouse and Kiruna.
    - Note any anomalies and think about possible explanations.

Part 2: Results Analysis and Theoretical Comparison

1. Compare your observations to theoretical expectations:
    - How does temperature vary with altitude?
    - Do the experimental results align with general atmospheric models?
2. Reflect on factors that might cause deviations, such as:
    - Local climate conditions.
    - Seasonal variations.
    - Measurement uncertainties.

Part 3: Conclusion

1. Write a short conclusion summarizing:
    - Key findings from your analysis.
    - Differences between Toulouse and Kiruna and their implications.
    - Why these data are crucial for understanding climate change.

Part 4: Poster Presentation

1. Use the provided poster template to present your work. Include:
    - **Introduction**: Context and objectives of the study.
    - **Graphs**: Clearly labelled temperature vs. altitude graphs for both locations.
    - **Analysis**: Main differences and comparisons to theory.
    - **Conclusion**: Why the study matters for climate science.
2. Prepare to present your poster in English during the second session.

Annex

A step-by-step guide on creating graphs in LibreOffice Calc is attached to help you format your data and design effective visuals.

Good luck! Remember, clear communication and teamwork are key to success!

EXPLORA PROJECT

Temperature vs Altitude

TOULOUSE

INSERT CHART HERE

KIRUNA

INSERT CHART HERE

WHAT WAS EXPECTED ?

PROVIDE THEORETICAL INFORMATION HERE ABOUT THE EXPECTED RESULTS. YOU CAN ADD CHARTS, IMAGES, AND TEXT.

THE TEAM

INSERT A PHOTO OF YOUR TEAM

CONCLUSION

CONCLUDE ON THE USEFULNESS OF YOUR WORK.

RYMDGYMNASIET KIRUNA

Lycée de l'Espace

Creating a Temperature vs Altitude Graph in LibreOffice Calc

Step 1: Open the File and Select Data

1. Open the provided Excel file in LibreOffice Calc.
2. Locate the worksheet for the city you want to analyse (e.g., **Toulouse** or **Kiruna**).
3. Ensure the data is structured with **Altitude** in one column and **Temperature** in another.

Step 2: Insert a Chart

1. Highlight the data range for **Altitude** and **Temperature** (including the headers if they exist).
2. Go to the menu and click on **Insert > Chart**.

Step 3: Configure the Chart

1. In the Chart Wizard:
    - **Chart Type**: Select **XY (Scatter)**.
    - Click **Next**.
2. Assign data series:
    - Ensure the **X-axis** is set to **Temperature**.
    - Set the **Y-axis** to **Altitude**.
3. Click **Next** to format the chart further.

Step 4: Customize the Chart

1. Add axis labels:
    - X-axis: *Temperature (°C)*.
    - Y-axis: *Altitude (m)*.
2. Add a chart title, such as *"Temperature vs Altitude for Toulouse"*.

Step 5: Style and Finalize

1. Adjust the gridlines, colors, and fonts as needed for clarity.
2. Right-click the chart and select **Edit** for further customization.

Step 6: Save and Repeat

1. Save the worksheet for Toulouse.
2. Repeat the same steps for the Kiruna dataset.