Data Literacy Toolkit

Europe and Eurasia Region

The Data Literacy Toolkit is a **collection of short learning activities designed to enhance and expand students' data literacy skills**. These activities **can easily be integrated into GLOBE teaching** or training sessions.

The Toolkit **covers the four Earth spheres**: Atmosphere, Hydrosphere, Biosphere, and Pedosphere. Two learning activities have been created for each sphere, **based on the examples from teachers** who have an expertise in GLOBE, and do data analysis and interpretation as a part of their classroom practice. Each activity takes **approximately 20-45 minutes** to complete and we recommend teachers to include those into their regular lessons of Science or Mathematics. One does not need to have an experience with student research projects to carry out the tasks.

Who is the toolkit for
The toolkit is intended for **GLOBE teachers** who want to introduce their students to data literacy skills at a beginner's level. The activities are suitable for elementary to high school students. They can be also used by **trainers** during GLOBE teacher trainings to showcase the potential of enhancing student skills by using GLOBE data.

What you will find in the activities
Each activity contains **questions for students** (or trainees), a **dataset** to work with, and corresponding **results**. The introduction of each activity provides information about the topic, the target age group, the skills to be developed, and an overarching concept.

What you (don´t) need to do the activities
These activities are **primarily designed for classroom use**; thus, no specific GLOBE measurement tools or practical measurement skills are required. The focus is on data literacy skills rather than practicing the GLOBE protocols. While a basic understanding of GLOBE measurements is helpful, **extensive knowledge of the activity's topic is not necessary.**

The toolkit has been developed by the GLOBE Coordination Office for Europe and Eurasia in collaboration with GLOBE trainers.

List of Data Literacy Activities

Air Temperature Across GLOBE During a Year (Atmosphere)
Topic: Visual presentation and interpretation of air temperature annual pattern for sites in various countries/continents and located at similar elevation.
Age of students: 12-15
Skills developed: critical evaluation of the annual trends and patterns of the data, selecting the most efficient format of dataset visual presentation in graph, interpreting the visualized data, asking questions on why the data differ from each other

Air Temperature Across GLOBE on the Same Day (Atmosphere)

Topic: Comparison of the air temperature measured at different locations at similar latitude the same day (noon local time).
Age of students: 7-12
Skills developed: graph construction (incl. correct description of axis and legend), comparing the data of the same parameter, asking questions on why the data differ from each other

Soil Properties Along the Cetina River Basin (Pedosphere)

Topic: Looking at the soil properties along the river stream from its origin to the sea and interpreting the data collected.
Age of students: 12-15
Skills developed: understanding and interpretation of data collected, finding similarities and differences in data collected, basic orientation in the data clustered in a spreadsheet, learning about soil characteristics

Comparison of Tree Height Measurements (Biosphere)

Topic: Comparison of tree height measurement results using clinometer and GLOBE Observer app
Age of students: 12-15
Skills developed: the ability to compare two data sets, analyze and interpret the differences and recognize and identify potential sources of measurement error in these data sets

Comparison of the Green-up Timing at Different Locations (Biosphere)

Topic: Comparison of the timing of budburst and leaf growth at two locations in Croatia (Varaždin and Belišće)
Age of students: 10-12
Skills developed: comparing and examining collected datasets, calculating average, finding potential measurement errors

Air and Water Temperatures Changes during the Year (Hydrosphere)

Topic: Comparison of water and air temperatures measured at the same location over the year.
Age of students: 10 - 13
Skills developed: data comparison; finding differences when using different scales; data interpretation; trend differences of temperatures during the year; deeper understanding of the complex interactions between air and water temperatures

Water Temperature Trend (Hydrosphere)

Topic: Comparison of water temperature at three locations near each other - in the river, at the mouth of the river and in the bay.
Age of students: 10 - 15
Skills developed: reading and comparing graphs; comparing water temperatures measured at different study sites; calculation of the difference between the highest and lowest measured water temperature; trend differences of water temperature during the year