

## Education and Formation: STEM in the Tradition of Alexander von Humboldt

Alexander von Humboldt is known as a great naturalist and explorer who wanted to understand and describe the explored space as a whole in many different ways. More than anyone else, he was able to view and examine scientifically correct facts additionally under criteria of aesthetics. Thus, in many respects, he was a pioneer of an interdisciplinary way of working and researching, which is also exemplary for today's teaching.

The central pivot for Humboldt's work is formed by the STEM subjects astronomy, chemistry, geography, forestry and physics. Some historical measurements from the respective disciplines will be presented and compared with current measurements. While in his time Humboldt was only able to determine heights by means of a barometer and by calculating angles, today remote sensing methods such as the stereoscopic evaluation of (digital) aerial image pairs and the calculation of digital terrain models as well as radar data are available. Technological progress makes possible not only the calculation of the earth's surface, but also the determination of phytomass. We are able to reproduce Humboldt's measurements and to perfect them with modern methods. In the sense of the scholar, regularities and regularities can be represented cartographically, among other things, which are to be thematized in science and technology lessons. Furthermore, they offer points of contact for neighboring sciences and bear witness to Alexander von Humboldt's extensive work and scientific foresight.

Analogous to the wealth of material in the STEM subjects, Humboldt was able to grasp the totality of a landscape with all its phenomena and processes and to draw conclusions from it that are still valid today. For example, the mapping and publication of the three-dimensional distribution of vegetation, the global change of the earth's magnetic field, the temperature change with the geographical latitude or the ocean currents go back to him.

The breadth of Alexander von Humboldt's impact makes him an iconic figure as a figure in the various STEM subjects, creating occasions to advance integration while respecting the respective sciences.

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