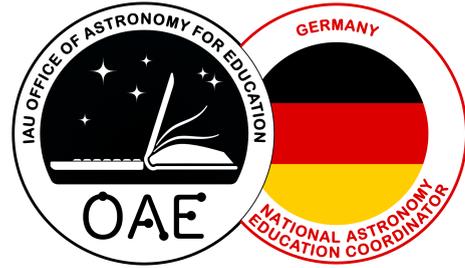


Astronomy Education in Germany



This overview is part of the project "Astronomy Education Worldwide" of the International Astronomical Union's Office of Astronomy for Education.

More information: <https://astro4edu.org/worldwide>

Structure of education: Germany consists of 16 federal states and each of them has its individual educational system. German curricula only provide guidelines about the individual subjects, as well as information about which school subjects are mandatory and about those, which possibly can be chosen. The majority of German schools are state-owned-only about 11% are private institutions. Naturally, the guidelines apply for all schools in Germany. The German educational system's structure is highly complex with many special ways and different school types – that is why the following comments are only going to be an initial approach. Most young children, aged between three and six (93% of all children at this age) start their pre-school life in kindergarten. Usually, most children enter school at the age of six. To start off their educational career, children visit primary schools –which are attended by pupils in most of the federal states for 4 years (e.g. Hesse, Thuringia), though a duration of 6 years (Brandenburg) may also be possible. After finishing elementary school, the pupils, along with their parents, have to choose between the following school types: Hauptschule (grade 5-9), Realschule (5-10) or Gymnasium (grade 5-12/13). In some federal states, another kind of educational institution can be found: German Gesamtschule (grade 5-12/13). Some federal states in Germany demand 12 years of education, in order to acquire the A-Levels enabling them to enter university, also called *Abitur* in German. In a few federal states even 13 years of school are required for students to graduate.

Education facilities: Typical class size depends on pupils' age. In primary school (grade 1-4/6) about 18-22 pupils attend a class together, while highschool classes consist of up to 26-30 students. The majority of school buildings and their technical furnishing are in a good state. During the last years, the federal states (with financial support by the state of Germany) have been investing in better equipment in order to be able to handle the digitization of schools well. Still, Germany has yet to face her greatest problem: the immense lack of teachers. This especially applies to numerous schools looking for teachers of natural sciences.

Governance and organisation: Curricula are decided by the individual federal states although these are often modified by individual schools. Schools are mostly run by local district or city councils.

Teacher Training: In order to become a teacher, all students have to undergo training in university. The duration and graduate degree of a student's studies depends on the school type chosen, as well as on the school they aim to work at later. After entering the workforce, they are furthermore required to take part in further training, depending on the federal state where they teach. On top of that, every federal state has its own institute for advanced teacher-training. These institutes organise advanced training courses for all different school types, as well as for different school subjects. Three German universities offer study courses for students seeking to become astronomy teachers (Jena, Halle, Rostock).

Astronomy in the curriculum: Even today, great differences regarding the role of astronomy as a subject can be spotted across German schools. Due to this reason, it remains difficult to speak about astronomy in the German educational system. In the former FRG (West Germany) astronomy played a rather limited role. Solely a few federal states, such as Niedersachsen, offered specialised courses in astronomy for one or two years at advanced classes(grade > 9). In most federal states, some parts of astronomy are taught in physics, geography or natural sciences. In most of German elementary schools, pupils are only taught the basics of astronomy. In particular this refers to: the motions of sun, earth and moon, the cause of the seasons, basics of the solar system etc. In higher classes those contents are merely taught at an advanced level (in geography, physics, natural sciences classes). Only during specialised classes, are children able to learn more about astrophysics, space travel etc. Interestingly, the status and role of astronomy in schools of the former GDR (East Germany) is highly different compared to West-German schools. Since 1959, in all of the new federal states of Germany (Thuringia, Saxony, Saxony-Anhalt, Brandenburg, Mecklenburg-West Pomerania) astronomy has been implemented into the curriculum as a typical school subject (in class 9 or 10). Just to provide an example: in the federal state of Thuringia every student, disregarded of school type, has to take astronomy classes at grade 9 or 10. Furthermore, in a best-case scenario it is possible to visit a course in class 11 and 12.

Astronomy education outside the classroom: Germany has various school and public observatories, as well as about 100 planetariums. Some of those, especially the smaller ones with a diameter of 6m to 8m, are also part of public schools. In most of these places you can find additional astronomical clubs.

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