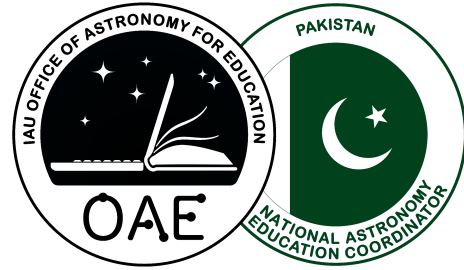


Astronomy Education in Pakistan



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: The six major grades of Education in Pakistan are:

- A. Early Years (Pre-School) Children aged 3-5 years
- B. Primary Education. (Grade 1-5)
- C. Middle Education (Grade 6-8)
- D. Secondary (Grade 9-10) earns Secondary School Certificate (SSC)
- E. Higher Secondary (Grade 11-12) leads to HSSC
- F. Undergraduate or University Education

Education Subsystems in Pakistan are categorized as

- A. Government (Public) School system. A significant portion of the school-going population is enrolled in state run education system.
- B. Private School System. The private sector has a higher standard of education and is considered at par with the educational systems of developed nations.
- C. Missionary Schools also fall under the category of the private education sector.
- D. Madrassa School system completely focuses on religious education and knowledge and lacks the delivery of standard modern education including science.

Considering these significant variations, the Government of Pakistan is presently pursuing revision to the syllabus at the National level termed as "Single National Curriculum" (SNC) that aims to provide uniformity in the education systems throughout the country. SNC will be implemented in three phases; for Grades 1-3, Grade 4-8, and for Grades 9-12, between August 2021 to 2023. Pakistan is a linguistically diverse country with 74 languages, The primary languages used in education are Urdu and English. At the provincial level, some educational institutes and examination boards still teach regional languages in primary and secondary schools.

Education facilities: Public schools have typical class sizes of around 45-50 pupils. The private schools have a better teacher to pupil ratio and host class size of around 25. The public schools generally have a reasonable size school building with basic amenities and permanent staff members but usually lack internet facilities as well as devices. The private schools usually rent residential buildings, lack playgrounds, and labs. However, they make up by engaging more qualified faculty and featuring regular co-curricular programs. The private schools have an ICT literate faculty as well as internet connections. The students there belonging to the affluent class usually possess their own devices.

Governance and organisation: Public schools are managed at the provincial level. Each province manages education through district-level education boards. These boards administer certifying exams at the end of grade 10 and grade 12. A federal-level board institutes similar oversight and educational certification for federal entities. Private school systems have adopted Federal, provincial (IX, X Matric

& XI, XII F.S.C), and Cambridge (O &A levels) international qualifications systems. There are few prominent chains of these schooling systems that operate across all major urban centers of the country and are able to attract students from middle, upper-middle and elite segments. Most of the students from these schools undertake Cambridge O and A level exams whereas few also opt from the International Baccalaureate program. These private education systems however are costly which are beyond the affordability of a common Pakistani citizen.

Teacher Training: Primary school teachers mostly study undergraduate degrees in different subjects. A degree in education however is incentivized in the public sector through pay increments. Secondary physics teachers either study for a degree in mathematics, physics, or engineering discipline at a university. Teacher training for those already working is typically done with a few “in-service” training days per year in both the private and public sectors.

Astronomy in the curriculum: Overall astronomy education as a subject has no roots in the education system and there are no specific courses related to astronomy in the curriculum. However, it has been taught at different levels in rudimentary form. In Primary education (grade 1-5) students are introduced to the Solar system, Eclipses, changes in weather in science, and social studies. Secondary and Higher Secondary school students in Federal education (grade IX &X) are briefly introduced to the concepts of Newtonian gravity, gravitational laws, orbital velocity, and Special relativity, Black body radiations respectively. However Black body radiations are introduced more generally than to have a connection to astronomy education. Even the Cambridge education system has just recently added Space Physics in their O-level curriculum i.e. Year 2021.

Astronomy education outside the classroom: There are few amateurs astronomical societies in three major urban centers of Pakistan are Islamabad, Lahore, and Karachi. Some universities host observatories like the Institute of Space Technology (IST) in Islamabad and the Institute of Space Science and Technology University of Karachi (ISST-UoK). However, these are not in access to the general public. Few observatories are managed by private entities like Taqwa, Kastrodome, ZED, and Eden Observatories. These private organizations and societies are more approachable and contribute significantly to astronomy popularization. Few other not-for-profits and for-profit projects and organizations are conducting space and astronomy awareness outreach efforts including Cosmic Tribe a private organization and SUPARCO, the National Space Agency of Pakistan, initiative titled ‘Space Education and Awareness Drive’ SEAD. People are working in individual capacities as well like “School of Astronomy and Physics by Mirwat “. There are three planetariums in Pakistan based in Lahore, Peshawar, and Karachi but only one planetarium is functional that is located in Karachi. All these planetariums are working under Pakistan International Airlines.

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