Astronomy Education in

Italy

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: Children begin formal schooling at aged 6 after one or two years of nursery (kindergarten).
There then follows 10 years of compulsory school subdivided in:

- first cycle of education
  - 5 yrs of primary education, from 6 to 11 yrs old;
  - 3 yrs of lower secondary school, from 11 to 14 yrs old. At the end of the lower secondary school, students take a national qualifications in all (8-10) subjects.
- second cycle of education
  - 2 yrs of upper secondary school, from 14 to 16 yrs old.

Students can complete their second cycle of education attending upper secondary school for three more years, from 16 to 19 years old. At the end of the upper secondary school, students take a national qualifications in all (8-10) subjects. All 10 years of compulsory education at public (state) schools are free of charge. The last three years foresee a very low tax contribution, the amount dependind on the economical status of the family (about 50 € per pupil per school yr). There are also private schools which charge fees. They account for 5,0% of pupils Most of them are Catholic, representing 3,6% of pupils. If kindergartens are taken into account these two percentage raise until 11% and 7%. Most schools are held in the Italian language, while some regions have a two languages scholar system: Italian & French in Valle d'Aosta and some places in Piemonte and Puglia; Italia & German in Alto Adige.
The upper secondary school system is articulated in three different kind of schools:

1. Liceo, which has 6 different addresses: *arts*, *classical*, *linguistics*, *musical*, *scientific*, *human sciences*. Some of them have sud-addresses. Scientific high school is the largest reservoir for university studies.
2. Technical Institute. There are two address: *economical* and *technological*, both of which have several sub-*addresses* and sub-sub-addresses (more than 20)
3. Professional Institute, with two addresses: *services* and *factory and handcraft*, both of which with several adresses and sub-adresses.

Education facilities: Both in primary and in secondary schools, the class size varies from a minimum number of pupils to a maximum, depending on the number of disabilities within the class.
Primary schools: 15 (min) – 25 (max). In smaller islands, mountains and in areas inhabitated by linguistics minority the minimum decreases to 10 pupils.
Lower secondary schools: 18 (min) – 27 (max). Upper secondary schools: 27 (min) – 30 (max).
Exceptions are foreseen for smaller islands, mountains and linguistics minorities, where small schools can have teachers teaching groups from multiple yrs together (not more than 18 pupils).

All schools have access to running water and internet connections. Many classrooms are furnished with multimedia interactive whiteboards. School buildings are generally well-maintained but 66% of them was built before 1976, while 8,6% has some kind of structural system, attic or coverage problem or a combination of these. In Licei, there is a quite widespread lack of laboratories even if the situation is getting better and better.

Governance and organisation: The Ministry of Education (Ministero dell'Istruzione, MI) is responsible for the general administration at national level. MI is organised through Regional School Offices (Uffici Scolastici Regionali, USR). Furthermore, MI has several bodies and agencies that operate at national level with representative, consultative, monitoring and evaluative functions.
Curricula are set at national level by MI, through specific working groups. The curricula were last reformed in 2010 and 2012, with some revisions in the following years.
Public primary and lower seconday school buildings are owned by municipalities while the upper seconday school buildings by metropolitan cities (as Milano or Rome) or Districts.

Teacher Training: Primary school teachers must hold a 5 years master's degree (laurea magistrale) in education at a university. Secondary school physics teachers must hold a 5 years master's degree in physics, maths or engineering at a university, while science teachers must hold a 5 years master's degree in chemistry, biology or geology. Teachers are then selected by specific non-periodic open competitive exams at national level.
Teacher training for those already working is done with a few "in-service" training days per year and it is not compulsory. Teachers can attend courses (on line or in person) offered by high education institutes (as Inaf or universities) through the web platform SOFIA.

Astronomy in the curriculum: Officially there are no specialised school courses in astronomy.
In primary school, pupils study Science, which comprises biology, human body, Earth science and some astronomical contents: night/day and the Sun trajectory, seasons. There is a good freedom for teachers to propose some more contents depending on theirs competences. In some primary school books, many astronomical themes are briefly discussed, as stars, galaxies and even the universe evolution.
In lower secondary schools, within the Science curriculum, they encounter astronomical contents on the last year: Earth movements, seasons, eclipses and "the most evident celestial phenomena through direct observations or with planetaria and other kind of software". They should experience some laboratories too. In upper secondary school, kids learn about gravity, Kepler's law (first two years) and all the main physical processes and conceipts to understand astrophysics at an elementary level. The last year they studies modern physics theories as special relativity and quantuum mechanics, elementary particles and/or astrophycs and cosmology.

Astronomy education outside the classroom: Science or astronomy outreach centres, museums and planetaria are quite diffuse in Italy, from north to south and the islands. There is also a national association of astronomy amateurs (UAI) and many other local clubs. The Italian Astronomical Society (SAIt) collects astronomers, teachers and – in principle – amateur astronomers.

The International Astronomical Union's National Astronomy Education Coordinator (NAEC) Team for Italy: Stefano Sandrelli (Chair)

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