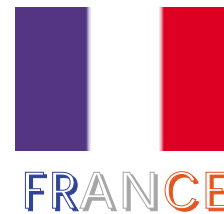




IMPRESSE (2) - RENNES

Pupils' experimental activities



Official aspects

PRIMARY SCHOOL

- ◆ Experimental activities from the first year of primary school (6 yrs). Possible in nursery school (3 yrs).
- ◆ Science and technology teaching is mandatory throughout school life.
- ◆ About 3 hrs/wk, science teaching including experimental activities.
- ◆ Activities are also offered outside the educational system (clubs, societies, etc.).

LOWER SECONDARY SCHOOL

- ◆ Science teaching hours are 1 1/2 hr/wk biology for 11 year olds and 1 1/2 hr/wk biology + 1 1/2 hr/wk physics-chemistry for 12 to 16 year olds.
- ◆ Teachers also do classroom experiments.
- ◆ Lab work is mandatory, but no fixed amount of time is specified.
- ◆ The national curriculum advocates a research pedagogy based on the pupils' lab work (learning by doing).
- ◆ Pupils are rarely tested on this work.



UPPER SECONDARY SCHOOL

General and technical education

- ◆ All pupils, whether specialising in science or not, are obliged to receive teaching in sciences, including compulsory experiments ("lab work" or "practical"). Specific teaching time is provided for practical in the curriculum.
- ◆ Class size for theoretical teaching is between 25 and 35 pupils, and for practical a maximum of 25.
- ◆ Lab work is part of the pedagogical syllabus of the course. It generally consists of quantitative measurements and modelling activities.
- ◆ The amount of time spent weekly on practical depends on the kind of course (general or technological; scientific or non-scientific). In general education:
 - ALL 16 year olds have 3 hrs/wk divided equally between physics-chemistry and biology-geology.
 - 17-18 year olds specialising in sciences have about 4 hrs/wk, and other pupils have 1 to 2 hrs/wk.

Technical aspects

- ◆ 20 to 30 children in a class.
- ◆ Children receive the same science teaching. On a given topic, they may perform different experiments.
- ◆ Neither school laboratory, nor technician.
- ◆ Science teaching throughout the school may be the particular responsibility of one teacher.
- ◆ Schools are funded by municipalities, whose financial resources may vary greatly.

- ◆ The teaching group is the "classe" of 24 to 30 pupils. Although experimental activities might be conducted in smaller groups, such a number of students does not allow the teachers to do as much lab work as they would like to.
- ◆ Specific classrooms are available, allowing all pupils to work at the same time (water, power, etc.).
- ◆ Usually no lab technician; the running of the laboratory is done by the teachers and this is allowed for in their teaching time (1 hr/wk).
- ◆ Schools are provided with equipment by local authorities. The science laboratories receive an operating budget for chemicals, glassware and small items.

- ◆ Students work in pairs in specific classrooms on the same experiment, related to the general topic of the week. This implies that all equipment for any given experiment must exist in 10 to 12 sets (per room).
- ◆ The science block includes ordinary classrooms, laboratories for practical, and storage room for equipment.
- ◆ Full time laboratory staff + one teacher for supervising (counted as 1 hour of teaching).
- ◆ Equipment is provided by the local authority responsible for the school. Science laboratories receive an operating budget for chemicals, glassware and small items.

Assessment

- For scientific general courses:
- ◆ End of studies (18 yrs) assessment by examination. Each pupil is assessed individually, on standard equipment in the laboratory, during 1 hour. It started only 3 years ago in physics-chemistry and 1 year ago in biology-geology.
 - ◆ In physics-chemistry, this assessment is mainly based on experimenting and measuring skills.



UdPPC views, and the issues we would like to see debated...

- ◆ Our association was founded in 1906 because of the introduction in our official instructions of pupils' experimental activities. No physics and chemistry teacher today could imagine these subjects being taught without lab work!
- ◆ UdPPC is convinced of the need for practical work not only for scientific and methodological reasons linked our subjects, but also to motivate pupils.
- ◆ In order to promote this argument, we would like more scientific and didactical research to be done, in order to find answers to a series of questions:



- ☞ Are the objectives of the experimental activities specific to these activities? Could they be met through other activities (documentary act., projects, etc.)?
- ☞ How and what does a child learn when he/she experiments?
- ☞ How can we train teachers better to design and supervise experimental activities?
- ☞ What can be assessed in these activities and how can it be done?