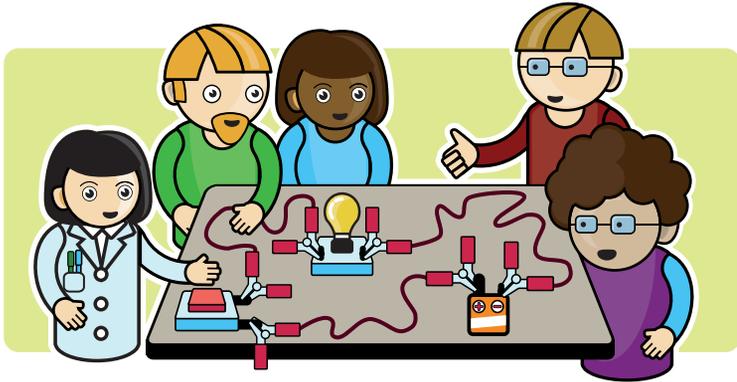


Supporting teacher training



What does this consist in?

This form of support involves the participation of a scientist in initial or continuous teacher training (internships, events, autumn universities...).

The goals are:

- to develop a taste for science among participants by offering a vision of science in the field as it is carried out in the world of research;
- to answer questions concerning scientific notions;
- to present experiments in order to better understand certain concepts;
- to create a relationship between science in the laboratory and science as it is taught in schools.

A few characteristics of support during teacher training

Support during teacher training aims to:

- establish a relationship based on confidence with the teacher so that he can express his difficulties, questions, points of view, without fear of being judged.
- raise awareness among teachers that scientific knowledge and reasoning are accessible and that they can be taught without fear.



Testimony

The pleasures of this collaboration

... for example, the elaboration of a conclusion with, against all hope, an adult or child who has said nothing the whole time, and who suddenly can't help but take part. Or perhaps, when someone blurts out "but, it's the same when we..." Or maybe an experiment that has been adapted, completed, often in a surprising and relevant way, which reverses the roles. Finally, the satisfaction of seeing the people trained unexpectedly enjoy themselves, to feel them "hooked", to hear them say they want to share this discovery with the children, to observe their new-found autonomy.

All this intelligence, both individual and collective, where you can see the cognitive wheels turning because there is no interest in hiding one's ignorance, pretending to know, is fascinating. It enables us, using practically nothing, to reach subtle notions and all their shades of meaning, to distinguish the links woven between them.

Marima Hvass, trainer for the association 1,2,3,sciences.

In this context the activities are designed

- to promote types of training where the teacher is active and not just a listener, so that he can appropriate the inquiry-based approach through practice. It is through these "learning situations" that teachers, faced with a basic scientific problem, can understand the use of experimental methods and the framework (upstream: observation, questions, formulation of a hypothesis, translation into an experiment; downstream: interpretation and formulation of results, validation or not of the hypothesis, search for other factors);
- to establish a link between classroom activities and scientific research and demonstrate that the "science which is happening" is also related to apparently simpler scientific questions;
- to enable the distinction between an inquiry-based pedagogical approach and scientific research;
- to show that science is universal and developed collectively.



Testimony

The EMNantes regularly takes part in continuous training programmes for elementary school teachers organised by Academic Inspectors, the IUFM (teacher's college) and the Diocese for the catholic schools. The teachers are not only interested in acquiring scientific knowledge, but also in discovering, in an active way, the researcher's approach in the lab. The emphasis is placed on scientific investigation and the experimental approach.

The main goal of the sessions is to provide teachers with a different vision of experimental practices and to dissipate any fears linked with scientific activities. It's also an opportunity for the teachers to visit a scientific establishment that they can use later on as a resource centre.

Ludovic Klein, EMNantes engineering school

A few guidelines for effective support

It is essential that the scientist takes into account the profession, training and technical and scientific culture of the teacher.

Moreover, he should make sure that:

- training promotes contact between teachers and the subject itself: investigation followed by experiments, observations, questioning... carried out by the teachers themselves;
- theoretical interpretation dovetails with the experimental activity of which it is a part;
- teachers are confronted at the same time with
 - manipulations that are conceptually simple but tricky to carry out;
 - experimental protocols that seem simple, but whose interpretation can be difficult or lead to erroneous explanations.

The idea is to raise awareness of the difficulties created by experimental practices and the importance of orienting and applying them in a relevant way. Therefore they should be more capable of choosing the best activities for their pupils and adapting them to the class.

- the training sessions include periods of collective discussion, debate and comparison of different points of view...
- scientific writing assignments (such as an experimental protocol) structure the experimental approach and promote exchanges.

- the teachers are encouraged to think about how they can take advantage of what they learn during the training situations and how to use this directly in their classes.

Pitfalls to avoid, hurdles to overcome

- Turning the course into a series of lectures: hands-on experiments and construction of the approach guarantee effectiveness.
- Not taking into account the specific characteristics of an audience of teachers: skills, role in the classroom and expectations linked to classroom practices.

➤ Training session in the inquiry-based approach carried out by trainers from IUFM and research-teachers from the Ecole des Mines de Nantes.



➤ Experiment carried out on the flow of sand. one sees a sand castle representing the famous sagrada Familia designed by the architect Antoni Gaudi.