

Welcome to the fourteenth issue of *Science in School*



In this issue, a common theme is the nature of science and how to teach it. Pierre Léna, interviewed in our feature article (page 10), believes that when teaching science “it’s important to convey the idea that science is a human and collective adventure, not a lonely and national activity”. For him, it is essential to exploit children’s curiosity. Science teacher Jörg Gutschank agrees:

“the point is not to know but to question, and to look for ways to solve problems” (online article).

This reflects the way scientists themselves work – an approach that makes them very employable, explains Yasemin Koc. “You present [scientists] with a problem, they divide it into its individual components, investigate where the problem might lie, and find an efficient solution” (online article).

Scientists are not unlike children – always asking questions. How did the Universe begin? What is matter? And how do we know? These were just some of the questions that scientists addressed at the recent EIROforum teacher school at CERN, Europe’s largest particle physics laboratory (page 6).

Particle physics may sound a long way from the classroom, but even if you were not lucky enough to visit CERN, you can still introduce the topic into your lessons – visualising cosmic rays with a homemade cloud chamber (page 36). Visualising particles is also crucial to the ‘Radon school survey’, in which students measure radioactivity levels in their homes by literally counting holes left by α -particles (page 54).

Radioactivity is a worry as a cause of genetic mutations, yet mutations are essential for evolution. Evolutionary adaptation occurs when particular DNA sequences help us to survive in our environment. Demonstrating which sequences are beneficial and how they help us survive is challenging but not impossible – for example in bacteria (page 58).

Whereas some microbes are dangerous, others have their uses, such as yeast – which is not only used to produce bread and beer, but can convert chemical energy into electricity (page 32). Alternatively, chemical energy can also be converted into light, and vice versa, as Peter Douglas and Mike Garley explain (page 63).

Light is also at the heart of Nataša Gros and her partners’ project: developing school experiments in spectrometry, such as measuring the levels of glucose in jam (page 42). Linked together, glucose units can form starch. Although starch is so familiar, scientists are still investigating its structure, slowly, step by step, in collaborative teams (page 22) – which brings us back in a full circle to the nature of scientific research.

I hope you enjoy these and the other articles in this issue – including the online-only ones.

Eleanor Hayes

Editor-in-Chief of *Science in School*

editor@scienceinschool.org

www.scienceinschool.org



About *Science in School*

Science in School promotes inspiring science teaching by encouraging communication between teachers, scientists and everyone else involved in European science education.

The journal addresses science teaching both across Europe and across disciplines: highlighting the best in teaching and cutting-edge scientific research. It covers not only biology, physics and chemistry, but also earth sciences, maths, engineering and medicine, focusing on interdisciplinary work. The contents include teaching materials; cutting-edge science; interviews with young scientists and inspiring teachers; reviews of books and other resources; and European events for teachers and students.

Science in School is published quarterly, both online and in print. The website is freely available, with articles in many European languages. The English-language print version is distributed free of charge within Europe.

Contact us

Dr Eleanor Hayes / Dr Marlene Rau

Science in School

European Molecular Biology Laboratory

Meyerhofstrasse 1

69117 Heidelberg

Germany

editor@scienceinschool.org

Subscriptions

Register online to:

- Receive an email alert when each issue is published
- Request a free print subscription (within Europe)
- Swap ideas with teachers and scientists in the *Science in School* online forum
- Post comments on articles in *Science in School*.

Submissions

We welcome articles submitted by scientists, teachers and others interested in European science education. Please see the author guidelines on our website.

Referee panel

Before publication, *Science in School* articles are reviewed by European science teachers to check that they are suitable for publication. If you would like to join our panel of referees, please read the guidelines on our website.

Book reviewers

If you would like to review books or other resources for *Science in School*, please read the guidelines on our website.

Translators

We offer articles online in many European languages. If you would like to volunteer to translate articles into your own language, please read the guidelines for translators on our website.

Advertising in *Science in School*

Science in School is the only European journal aimed at secondary-school science teachers across Europe and across the full spectrum of sciences. It is freely available online, and 20 000 full-colour printed copies are distributed each quarter.

The target readership of *Science in School* includes everyone involved in European science teaching, including:

- Secondary-school science teachers
- Scientists
- Science museums
- Curriculum authorities.

Web advertisements

Reach 30 000 science educators worldwide every month.

- € 200-350 per week

Print advertisements

- Full page: € 3150
- Half page: € 2285
- Quarter page: € 990
- Back cover (full page): € 5000

Distribution

Distribute flyers, DVDs or other materials to 3000 named subscribers or to all 20 000 print recipients. For more information, see

www.scienceinschool.org/advertising

or contact advertising@scienceinschool.org