



Why study? Chemistry

Chemistry



How studying GCSE Chemistry could lead to a job at Sizewell C

What does Chemistry have to do with the nuclear industry?

Chemists are absolutely essential to the safe and smooth operation of nuclear power plants! Nuclear chemists (those who specialise in radioactivity in atoms¹) play a fundamental role in the entire nuclear fuel cycle², helping with fuel manufacture, spent fuel reprocessing and waste treatment. Chemists also play a role in understanding the effects of radiation on reactor materials, contributing to safety, and helping to improve reactor and materials design.

You don't have to study all the way to degree level for chemistry to be a useful and relevant skill. A chemistry GCSE can set you up for many of the trades and other jobs that are vital to the nuclear industry. It helps demonstrate organised, critical thinking, and can show an ability to work with measurements and tools (such as spreadsheets), which help us analyse them.

Careers at Sizewell C

As a science, a chemistry GCSE meets the entry requirements for many of the jobs and apprenticeships you might find in a large nuclear project like Sizewell C. But a GCSE in chemistry isn't just vital to the operation of a nuclear power plant; it's a relevant qualification when it comes to designing and building one too.

As a **concrete operative**, you'll draw on your knowledge of chemistry to follow technical instructions and prevent flaws and failures. Or you might prefer the idea of being a **materials scientist**, responsible for evaluating materials to help develop better processes and products.

A chemistry GCSE will help you do the role of a **maintenance technician**³. Knowledge of chemistry will enable you to understand technical information and work in a logical and ordered way to inspect, test and repair plant equipment across the power industry. Or perhaps you'd prefer to work as a **lab technician**, helping isolate and analyse material or environmental samples taken around the plant.



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Career pathways using Chemistry

- Apprenticeships are a common route into roles like being a concrete operative or maintenance technician. You may need anything from two to five GCSEs to get onto a diploma or T Level course, or an advanced apprenticeship. Find out more on the government's [Apprenticeships website](#) or have a look for **Sizewell C apprenticeships**.
- You may need a degree to qualify for other roles, such as materials scientist. In some cases, having one may improve your employment prospects too.
- Alternatively, an internship or industrial placement can help you experience a role or industry. Your college or university should be able to help you find opportunities.
- EDF is working with local schools and colleges, such as **East Coast College (Lowestoft)**, **Suffolk New College** and **West Suffolk College**, so have a look at their websites for pathway courses too.

Chemistry skills



Like other scientists, chemists often make excellent **problem solvers**, applying their ability to absorb and analyse information to produce insight. They might be good at **listening**, while a good dose of **creativity** can help produce lightbulb moments to solve a challenge. Chemists are well equipped for **aiming high**, applying exacting standards to produce the best work.

Useful links

- icanbea...** Career ideas and opportunities in Norfolk and Suffolk
- Young SZC** Connecting young people to careers and apprenticeships in the region
- BBC Bitesize:** What GCSEs should I take?
- BBC:** Jobs that use chemistry

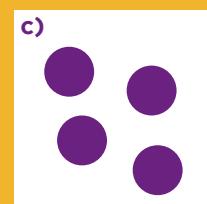
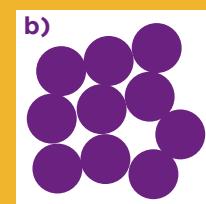
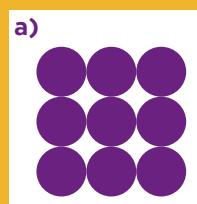
Chemistry



Chemistry in action

Are you curious about chemistry? Take our quick quiz to find out!

- Think of a boiling kettle. What's producing the steam?
 - Water is turning into mist
 - Water is boiling into a gas
 - The kettle's heating element is giving off fumes
- Once the water starts boiling, it doesn't get any hotter. Where's most of the heat energy from the kettle going?
 - It's changing the state of the water into steam
 - It's lost as heat
 - It's heating the kettle itself
- Steam is what happens when water turns into a gas. Which of these three diagrams best shows how its particles are arranged?



- In a power station, hot, high pressure steam is used to drive turbines. Which type of power station doesn't rely on steam?
 - A wind farm
 - A coal, oil or gas power plant
 - A nuclear power plant

Did you know?

Radioactive elements like uranium spontaneously 'decay', splitting into other elements and releasing a huge amount of heat. A single nuclear fuel pellet is about the size of an AA battery and weighs about 20g⁴. Yet it can provide the same amount of electricity as 400kg of coal, which is 20,000 times heavier!

Q1. b) Q2. a) Q3. c) Q4. a)
Answers:

- https://en.wikipedia.org/wiki/Nuclear_chemistry
- <https://www.rsc.org/globalassets/04-campaigning-outreach/tackling-the-worlds-challenges/energy/chemistry-in-nuclear-research-development.pdf> (page 2)
- <https://www.instituteforapprenticeships.org/apprenticeship-standards/maintenance-and-operations-engineering-technician-v1-3>
- <https://cna.ca/reactors-and-smrs/nuclear-fuel>

All information correct at the time of going to print in December 2023.
Some of the images come from our sister project, Hinkley Point C, in Somerset.