

Career Files teach about important jobs in science and how science is used in other jobs. Careers with the STEM symbol focus on Science, Technology, Engineering, or Math.



Chemistry is the study of matter. Chemists study the different substances, called *elements*, that make up matter. They often

conduct experiments to determine the properties of elements and to observe reactions when different elements are mixed together to make compounds.

Chemists usually specialize in one kind of chemistry. *Biochemists* are interested in matter that is found in living things, such as protein and DNA. *Organic chemists* work with materials such as plants and plastics that contain the element carbon. *Inorganic chemists* conduct experiments with metals and minerals. *Material chemists* analyze chemicals and try to make new materials out of them.



Biochemists monitoring a chemical reaction



A material chemist formulating a new kind of lubricant

Depending on the type of matter they study, chemists may work in a wide variety of settings. Some work for drug companies, where they invent new medicines. Others work in mines, where they study rocks and minerals. Still others work at universities, where they do experiments and teach chemistry to college students. All chemists must be able to follow the scientific method and organize their findings so they can share them with others.

Future chemists go to college to study math and science. Most chemists continue their education after earning a degree and learn even more about chemistry.

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Cooking is chemistry in the kitchen. It involves both physical and chemical changes. By mixing and cooking foods, oils, and spices, chefs create dishes that have delicious flavors and textures.

Chefs need to understand which ingredients work well together and how different cooking techniques can transform ingredients. For example, adding a touch of salt to a dish enhances flavor, and adding flour to a sauce makes it thicker. Chefs must be able to measure and blend ingredients.



Chefs use many different ingredients to create a dish.

They operate ovens, griddles, deep-fat fryers, and grills, as well as many other common kitchen appliances. In addition to cooking, chefs are often in charge of ordering, stocking, and restocking food supplies. Experienced chefs often oversee the work of other cooks and chefs.

Many chefs work on food preparation from beginning to end by making sure that foods are washed, cut, prepared, cooked, and presented well. Because cutting food is a large part of the job, chefs spend a lot of time practicing their knife skills. During food preparation, chefs need to be sure that working conditions are *hygienic* (clean) and safe.

The best chefs are artistic and creative. After high school, some chefs are self-taught and start working with little or no experience. Others attend culinary schools, where they learn all about food and how to prepare it.



A chef chopping mushrooms using a knife and a cutting board

Dairy Worker

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You probably use milk in your morning cereal, to dunk your cookies, or to mix chocolate in to make chocolate milk. But did you know that milk is a special kind of mixture called a *suspension*? A suspension forms when tiny particles of matter are mixed into a liquid.

Dairies are places that gather raw milk from cows. The milk collected from the cows is processed for drinking or used to make many different products, such as cheese and yogurt. Dairy workers use machines to milk the cows and to separate the cream from the rest of the milk once it has been collected. Keeping those machines sanitary and working well is one of the jobs of a dairy worker.

Dairy workers are in charge of many things related to milk production. Some workers make sure that cows are milked on a regular schedule and that machines are functioning properly. Others are in charge of feeding and



A dairy worker caring for a newborn calf

cleaning cows. All dairy workers concentrate on keeping cows healthy so they are able to produce milk. Dairy workers must maintain logs regarding feeding, medical care, and milk production.

Experience working with cattle is required on most dairy farms. It is important to be able to recognize when a cow is sick or has a disease. Dairy workers must learn how to use and maintain dairy farm equipment. Many agricultural colleges offer special classes that train people for careers as dairy workers.



Cows lined up in preparation for milking