

Careers in Chemistry

Lesson Plan

Grade Level: 6-8

Curriculum Focus: Careers

Lesson Duration: Four class periods

Student Objectives

- Discuss the definition of chemistry and the different careers related to chemistry.
- Talk about how people use chemistry every day.
- Research one chemistry-related career for a class presentation.

Materials

- Discovery School video on *unitedstreaming: Forensic Detectives: Chemistry at Work*. Search for this video by using the video title (or a portion of it) as the keyword.

Selected clips that support this lesson plan:

- How Can Police Use Chemistry to Help Solve Crimes?
 - Geologists and Balloon Bomb Engineers Investigate Balloons
 - Investigating Arson
 - The Work of Pyrotechnicians
 - Drilling for Oil
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- Computer with Internet access
 - Poster board, markers, colored pencils, and other materials for student posters
 - Paper and pencils

Procedures

1. After watching *Forensic Detectives: Chemistry at Work*, ask students how they would define chemistry. Help them create a simple definition, such as "Chemistry is the structure and properties of substances and how they react to one another." or "Chemistry is about what substances are made of and how they combine."

2. Next, ask students to describe careers that involve chemistry based on what they viewed. Discuss what the following careers have in common. (They all deal with substances, their properties, and how they react with each other.)
 - Chemists who study the properties and reactive qualities of elements
 - Forensic scientists who use chemical analysis to identify or match evidence from a crime scene
 - Pyrotechnicians who combine chemicals that produce fireworks displays
 - Scientists and engineers who develop new materials
3. Tell students that chemistry is involved in many careers because chemicals are the basis for many of the products we use every day, from drugs to synthetic fibers to perfume. Almost all new products, from NASA spaceflight materials to new bubble-gum flavors, depend on chemistry. Examples follow:
 - Chemical engineers use or make new chemicals to solve problems and find practical applications.
 - Materials scientists use chemicals to discover and create new materials with unusual properties, such as a strong lightweight metal or a plastic that can conduct electricity.
 - Pharmacists, doctors, and nurses use chemistry to understand how drugs interact with the human body.
 - Food scientists are involved in making new ingredients or use chemistry to test food for quality and safety.
 - Safety and health inspectors analyze the safety of different places, from restaurants to water treatment plants.
4. Share the following list of chemistry-related careers with the class:
 - Agricultural chemist
 - Chemist
 - Chemical engineer
 - Chemical salesperson
 - Chemistry teacher or college professor
 - Environmental chemist
 - Food and flavor chemist
 - Forensic chemist
 - Geochemist (study chemicals in rocks)
 - Hazardous materials expert
 - Materials scientist
 - Medicinal chemist

- Pulp and paper chemist
- Safety or health inspector
- Textile chemist
- Water chemist

5. Have students research a chemistry-related job. They may choose one listed above or another from their own research. Have them answer the following questions:

General Questions

- What is the purpose of this job?
- What are some of its specific tasks?
- What kind of education and experience is required?
- In what kinds of places might people in this job work? (lab, outside, in an office, etc.)
- In what types of companies do people with this job work?

Personal Questions

- What would you like about this job?
- What wouldn't you like?
- What would be most challenging?
- Do you think this job is a good fit for you? Why or why not?

6. Share the following Web sites with the class. Give students at least one full class period to read about careers and select one to explore.

- Chemical Careers (list of careers, background, quotes, general information)
<http://www.chemistry.org/portal/a/c/s/1/acdisplay.html?DOC=vc2%5c3wk%5cwk3.html>
- A Day in the Life: Chemist
<http://www.princetonreview.com/cte/profiles/dayInLife.asp?careerID=34>
- A Day in the Life: Chemical Engineer
<http://www.princetonreview.com/cte/profiles/dayInLife.asp?careerID=33>
- What Do Chemical Engineers Do? (click "Job Descriptions")
<http://www.aiche.org/careers/overview.htm>
- Chemists and Materials Sciences
<http://www.bls.gov/oco/ocos049.htm>
- Chemical Engineers
<http://www.bls.gov/oco/ocos029.htm>
- Chemical and Engineering News: Career & Employment News (from flavor and fragrance chemists to those who discover and develop drugs)
<http://pubs.acs.org/cen/html/career.html>