Career News
Career Technical Education October 2012
Genesee Intermediate School District

More girls than ever pursuing careers in science

High demand, high pay in science fields

Science careers used to be largely filled with boys, but girls are finding that chemistry, biochemistry and biology careers fit their natural skills and career values too! In fact, more women than ever, up to 50%, are enrolled in chemistry, biochemistry and biology careers.

According to Kettering University Chemistry Professor, Montserrat Rabago-Smith, that's because girls like the process of solving problems and that's what they find in these topics. She says that motivations in science and math are important for helping more girls choose science-related careers.

These specialties rely on problem-solving processes and critical thinking to solve problems and females like to think through the process. Women tend to think of multiple possibilities at the same time. Organic chemistry really encourages the process thinking.

"As chemists we solve a lot of problems. You really need to learn critical thinking," Rabago-Smith said.

In addition these careers are truly focused on helping people. These fields use the properties of atoms to solve all kinds of problems and make people's lives better, Rabago-Smith adds.

"Everything around us is chemistry. We look at life from the molecular point of view and when you understand that, you can apply it anywhere. Once you know the chemical structure you can do something to fix the problem," she added.

Professor Montserrat Rabago-Smith says chemists need to learn to think critically.

For example, the work of chemists and biochemists involves things like developing new materials useful in health care and manufacturing. This includes developing materials for bone regrowth, better heart stents or projects that grow human tissue.

Graduates with this knowledge also work on teams with other specialists. For example, they may work with electrical engineers to develop devices that can read chemical reactions for healthcare or that might detect things like genetic diseases. They may work with mechanical engineers to manufacture better materials they've developed for hip replacement, cars or bicycles.

Find more information, see the career pathways section on the next page!

Lives Improve Through Engineering summer program for high school girls!

Find out how you can make a difference in the real world through engineering! If you have good grades in math and science, this program is for you!

High school juniors live on the Kettering University campus for two weeks this summer, interact with girls from across the United States as well as Kettering student mentors. You'll go on field trips to see female engineers at work and participate in many social experiences.

You'll discover how to prevent injuries by designing products like air bags and baby car seats, and then testing them with crash test dummies.

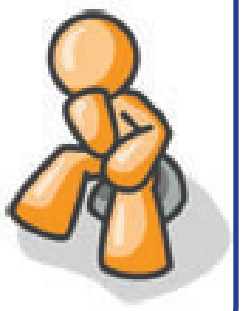
You'll learn how engineers repair joints, limbs and organs by making replacements that are functional and durable.

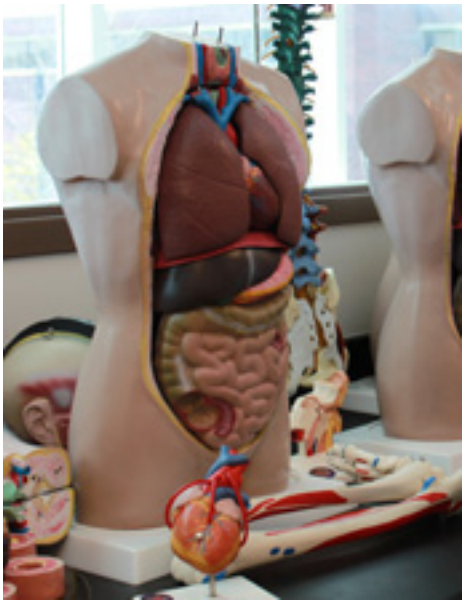
You'll learn about environmental challenges in engineering. And, you'll find out how engineers help solve crimes by combining science and technology. To find out more, go to http://www.kettering.edu/current-students/student-life/pre-college-programs lite-program.

Career Pathways: Chemistry, biochemistry and biology

- **Natural Resources and Business:** Testing, identifying and eliminating environmental pollutants
- **Health Care and Business:** Finding ways to diagnose diseases before they develop into serious problems, or finding better, long-lasting materials for medical implants. Discovering new ways to measure things like blood glucose.
- **Human Services and Business:** University professors research and teach – anything that's helped humanity is often discovered at this level and can have long-term impact.
- **Manufacturing/Engineering and Business:**

1. Chemistry helps make steel stronger in automobiles, and materials developers find ways to build better bicycles using state-of-the-art carbon fibers.
2. Chemists work on issues related to colors and light such as developing paint and carpet colors that last longer. Ultraviolet light is used in smoke detectors - chemists developed this technology.
3. **Alternative energies** rely on conversion of molecules such as found in the solar industry where workers develop micro cells that absorb light and convert to energy. Also, biodiesel is converted from oil, or waste materials are converted to gas.
4. The **Food industry** applies chemistry and biochemistry to develop new materials or pills that aren't harmful.
5. **Cosmetics Industry:** developing makeup or hair sprays. These professionals are also responsible for developing things like commercial skin-rejuvenating creams.





When am I ever going to use math?

Math foundations in high school really help in these fields:

- Probability is important in chemistry, biochemistry, biology because you have to know how often something is going to happen when trying out new materials.
- Volume and area because when experimenting with new materials, small samples in a lab may need to ultimately be produced in many gallons.
- It's important to understand metrics and know what the difference is going to be because compounds and molecules used need to be measured. Conversion between liters and gallons for liquids and for solids from kilograms to pounds are important.
- Properties of materials are important because these workers change something from small scales in the lab to larger scales for production.

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