Introduction

Hello and welcome again to the Certified Green Lab Program at the University of Illinois! The CGLP is a program of the Institute for Sustainability, Energy, and Environment, the UI's center for sustainability-focused research and campus sustainability improvement. We are very excited to be working with you to increase the sustainability of laboratories around our campus.

This week we will be reviewing the four Required Actions necessary for all levels of certification in the program, which must be implemented to the extent that they are applicable. As a reminder, completion of five Elective Actions beyond these initial actions will earn you Bronze level certification, completion of ten will earn Silver level certification, and fifteen Elective Actions will earn Gold level certification. Each forthcoming newsletter will review 1-3 Elective Actions.

The four Required Actions are:

1. Abide by the 12 principles of green chemistry. Post them in your lab.
2. Close the fume hood sash when you are not actively working in the hood. Post signage on your lab's fume hoods reminding others to do the same.
3. Use a minimum of 30% recycled paper.
4. Turn off lights when you leave the room, and put signage up prompting people to turn off the lights.

Instructions

Required Action #1: Abide by the 12 principles of green chemistry. Post them in your lab.

As defined by the International Union of Pure and Applied Chemistry, green chemistry is the "design of chemical products and processes that reduce or eliminate the use or generation of substances hazardous to humans, animals, plants, and the environment." Several chemists and researchers began practicing and developing concepts that would come to be a part of the methodology throughout the 80s and 90s. In 1998, these efforts were consolidated into the twelve principles known today by Paul Anastas and John C. Warner. The primary goals of green chemistry, resource efficiency and safer chemicals, are not only beneficial for the environment, but for you and your lab as well.

The principles are as follows:

1. Prevention
2. Atom Economy

3. Less Hazardous Chemical Syntheses
4. Designing Safer Chemicals
5. Safer Solvents and Auxiliaries
6. Design for Energy Efficiency
7. Use of Renewable Feedstocks
8. Reduce Derivatives
9. Catalysis
10. Design for Degradation
11. Real-time Analysis for Pollution Prevention
12. Inherently Safer Chemistry for Accident Prevention

More information on implementing these principles can be found on the American Chemical Society website as well as a variety of other online resources.

Required Action #2: Close the fume hood sash when you are not actively working in the hood. Post signage on your lab's fume hoods reminding others to do the same.

Fume hoods consume a huge portion of energy -- about two homes worth when they're *closed*. Until more efficient hoods are developed, this is going to be an unavoidable part of doing chemistry. However, making sure your fume hood is closed when you are not working in it can make a tremendous difference, considering that the energy consumption of an open sash leaps to 3.5 homes!

Saving the equivalent of the energy needed by one and a half homes is no small feat, and keeping the fume hood closed is also much safer for everyone in your lab. If your lab has a bad habit of leaving it open, get creative with ways to remind everyone to close it. Eye catching signs or small incentives might be a good place to start!

Read about the Shut the Sash Program at Harvard for inspiration and ideas. They even have a fume hood strategy white paper available for download!

Required Action #3: Use a minimum of 30% recycled paper.

An average U.S. office worker will use about 10,000 sheets of paper a year, which is about 1.2 trees. We might not have the stat for the average lab technician, but it's likely you use more than you think you do. However, using printer paper with at least a portion of recycled content reduces this impact. Purchasing this through iStores is cheaper than buying virgin paper. Talk to whoever is in charge of purchasing in your lab or your purchasing office to make this change -- they should have access to iStores.

1. Go to the iStore portal on the F&S website: https://my.fs.illinois.edu/fsportal/
2. Click the COPY PAPER AND SUPPLIES link in the top right sidebar.

3. Click on the case of 30% recycled content paper to order a full case or the ream to order just one ream.
4. Add the product to cart, and checkout.

Required Action #4: Turn off lights when you leave the room (unless they need to remain on), and put signage up prompting people to turn off the lights.

Turning off unneeded lab lights should be a no-brainer -- saving electricity will not only help the environment, but cut down on the cost of power bills as well. Though electricity costs will vary by a number of factors (bulb type, wattage, etcetera), one surefire and easy way to bring them down will always be to switch off the lights you don't need. It's of course most important to do this overnight, but if no one's going to be in the lab over lunch hour or for an afternoon, they should absolutely be switched off then as well! However, if there are scientific reasons that your lights need to remain on in your lab, we of course will not ask you to sacrifice your research for this action.

If your office has manual light switches, get people to pay attention to them. Download our "Not in use, turn off the juice" signage here, or make/download your own. Another helpful practice is to designate a daily volunteer to make sure lights and monitors are turned off at the end of the day. We have a template from our Certified Green Office Program to help coordinate this if it would be useful. Though it may be just as well to institute a rule that the last one out the lab every night is responsible for turning the lights off!