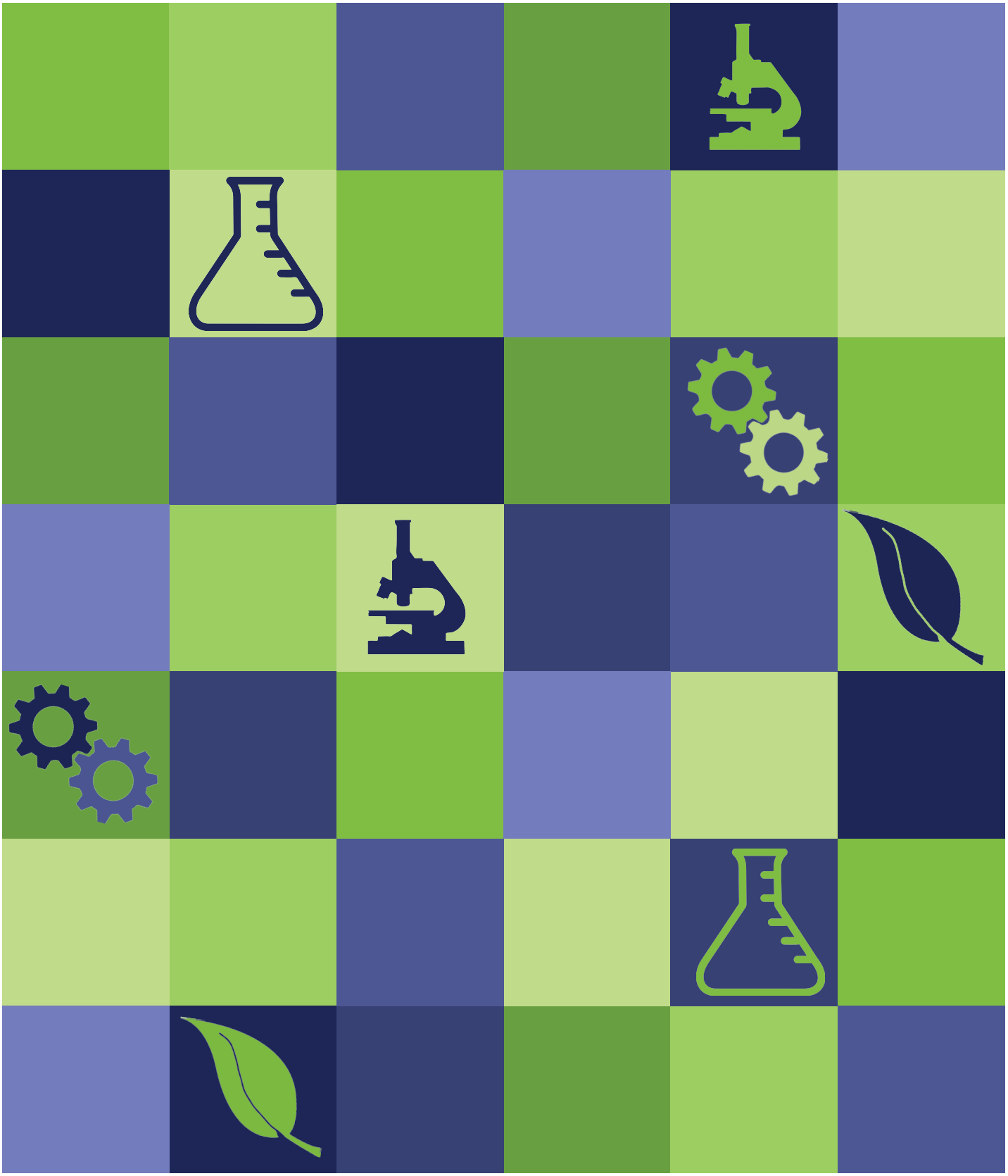
GREEN LAB

GREEN LAB

WHAT

Green Lab certification gives recognition to those who are helping to make their lab area safer for people and the greater environment. Born out of a partnership between Environmental Health and Safety, the Office of Sustainability and Villanova lab representatives, the certification is meant to unite all three efforts to improve lab safety and sustainability, without compromising lab productivity. Labs that achieve Green Lab certification will complete an eight category checklist, and implement enough sustainable and safety changes to meet the program requirements. All research and instructional labs are qualified for Green Lab certification. Certification is valid for two years, requiring reapplication to keep certification.

WHY

- **Save money**: Many credits will save your lab money year after year.
- **Distinction**: Green Lab certification provides your lab with distinction that may help in grant applications.
- **Reduce environmental footprint**: Program credits are targeted at reducing a lab's environmental footprint, including reducing water and energy usage, waste generation and use of toxic chemicals.
- **Safer working environment**: Keeping track of and reducing harmful chemical usage can improve your lab safety.

HOW

To complete certification, a lab must identify a Green Lab Champion (GLC) who will lead the lab's certification efforts. The GLC will coordinate with lab members to identify at least 50 achievable credits. Once a lab has implemented its qualifying credits, the GLC is responsible for getting signatures from all lab members (or instructors in the case of instructional labs), confirming their participation in the Green Labs program and support for the lab's new efforts. Completed applications are submitted to sustainability@villanova.edu for review. Labs that complete the minimum number of credits are titled as a Green Lab, given a sticker for their door and recognition throughout campus. During summer lab inspections, members of the Green Lab Committee will review your application and confirm all credit intentions have been meet.

Green Lab Certification Checklist

1. Labs must achieve 50 points and complete activities in at least 4 categories. If your lab contains ten chemicals or less, you will be given an additional 5 points towards certification.
2. Actions in bold are required.
3. Use the "Achieved" column to note points for completed activities (including those required).
4. Email completed checklist to sustainability@villanova.edu

ENGAGEMENT			
ID	Action	Points	Achieved
E.1	**Green Lab Champion communicates sustainability initiatives to staff and students who interact with the lab**	**1**	
E.2	Post the 12 Principles of Green Chemistry in the lab	1	
E.3	Host a lab cleanup event	2	
E.4	Green Lab Champion schedules routine meetings with lab members to discuss progress of sustainability initiatives	2	
E.5	Lab members received recognition of sustainability efforts	2	
E.6	Refer another lab to the Green Labs certification program	2	
E.7	Develop materials to share lab sustainability efforts	2	
WASTE			
WS.1	**Collect and recycle electronic waste**	**1**	
WS.2	Locate paper recycling bins next to all trash cans and/or printers	1	
WS.3	Recycle ink cartridges	1	
WS.4	Collect and recycle used batteries	1	
WS.5	Collect oils and lubricants	1	
WS.6	Display signage for recycling	1	
WS.7	Reuse items when practical	1	
WS.8	Eliminate all personal printers	1	
WS.9	Set printer defaults to duplex and black and white	1	
WS.10	Use the pipette refill opion	1	
WS.11	Identify a waste stream the lab wants to reduce and make efforts to minimize	2	
WS.12	End unwanted mailings and request electronic versions of laboratory catalogs	2	
WS.13	Reduce margins	2	
WS.14	Educate staff and students on proper recycling practices	2	
WS.15	Search ChemTracker for chemicals you need	2	
WS.16	Exchange mercury thermometers for other types	2	
WS.17	Collect, reuse and/or recycle plastic and metal containers	3	
WS.18	Collect and return packaging to suppliers	3	
WS.19	Reuse packing material	3	

ID	Action	Points	Achieved
MATERIALS			
MA.1	Coordinate purchases to minimize packaging	1	
MA.2	Maintain an inventory of supplies & check it before ordering additional supplies	2	
MA.3	Purchase items with recycled content	2	
MA.4	Use chlorine free paper	2	
MA.5	Use GelRed/GelGreen or Sybrsafe instead of EtBr	2	
MA.6	Share supplies to reduce extra quantities	2	
MA.7	Designate an area for office supply reuse	2	
MA.8	Use rechargeable batteries	3	
MA.9	Use green cleaning products	3	
MA.10	Use reusable dishes in common/break room	3	
MA.11	Use recyclable laboratory ware	3	
MA.12	Purchase furniture that is reused or manufactured with recycled content	3	
CHEMICAL USE AND STORAGE			
C.1	**Annually register the lab with Environmental Health and Safety**	**1**	
C.2	**Schedule and attend an EH&S annual laboratory walk through**	**1**	
C.3	**Work with volatile chemicals in the hood only**	**1**	
C.4	Containers of volatile substances are capped when not in use	1	
C.5	Use mercury-free reagents and equipment whenever possible	1	
C.6	**Complete inventory (or annual update) of all laboratory chemicals in Chem Tracker**	**2**	
C.7	Conduct training on proper chemical management for lab members	2	
C.8	Reduce the purchase and use of hazardous chemicals	2	
C.9	Develop a program to remove and properly dispose of obsolete chemicals	3	
C.10	Redesign a chemical reaction to reduce the need for chemicals	3	
EQUIPMENT			
EQ.1	Size new equipment appropriately	1	
EQ.2	Remove space heaters	1	
EQ.3	Turn off equipment when not in use (as appropriate)	1	
EQ.4	Efficient use of freezers	1	
EQ.5	Run autoclaves and dishwashers when full	1	
EQ.6	Share equipment	1	
EQ.7	Display signage for proper shutdown procedures	2	
EQ.8	Conduct an appliance audit to eliminate any un-necessary personal computers/refrigerators/equipment	2	
EQ.9	Consolidate freezer space	2	

ID	Action	Points	Achieved
EQUIPMENT			
EQ.10	Defrost freezers annually to prevent ice buildup	2	
EQ.11	Develop an archival plan for freezer samples to get rid of expired samples	2	
EQ.12	Buy and sell used equipment if possible	2	
EQ.13	Implement routine maintenance program for laboratory equipment	3	
EQ.14	Use timers on operating equipment	3	
EQ.15	Replace refrigerators that are more than 7 years old	3	
EQ.16	Ensure all new equipment is Energy Star certified	3	
ENERGY EFFICIENCY			
EE.1	**Turn off lights when leaving a room**	**1**	
EE.2	Use multi-level light switches and standby lights appropriately	1	
EE.3	Enable energy saving settings or power save mode on equipment	1	
EE.4	Keep fume hoods lowered	1	
EE.5	Close windows and doors if the HVAC system is on	1	
EE.6	Smart use of daylight	2	
EE.7	Use power strip and/or turn off or unplug chargers when not in use	2	
EE.8	Clean and organize lab spaces, including inside the fume hood, to reduce ventilation needs	2	
EE.9	Use task lighting rather than overhead lighting	3	
WATER			
WT.1	**Report maintenance issues through the Work Request System**	**1**	
WT.2	**Turn off the faucet when not in use**	**1**	
WT.3	Enable water saving mode on water using equipment	1	
WT.4	Use appropriate water quality	2	
WT.5	Wash equipment efficiently	2	
FIELD WORK			
FW.1	Recover batteries and electronics	1	
FW.2	Include sustainability considerations in the Field Safety Plan	1	
FW.3	Recover and reuse flagging and staking material	2	
FW.4	Reuse or recycle sample containers	2	
FW.5	Reduce travel impacts	2	
INNOVATION			
IN.1	Collect and return packaging to suppliers	3	
IN.2	Purchase/use an acetone recycling mechanism	3	
IN.3	Use sonication and microwave energy sources	3	
IN.4	Other: Identify a way to increase your lab's sustainability efforts that is not addressed in another section	3	
IN.5	Lab contains 10 chemicals or less	5	

Engagement

1 Point

E.1: Green Lab Champion communicates sustainability initiatives to staff and students who interact with the lab

- Green lab certification will not be effective if everyone in your lab is not aware of your efforts and what they need to do to reduce the lab's impact on the environment and human safety.
- Once the Green Lab Champion has identified the credits the lab is aiming to achieve, review each credit with lab occupants and address any concerns on implementation. As appropriate, assign responsibilities to lab members.

E.2: Post the 12 principles of green chemistry in the lab

- Review the 12 principles of green chemistry with lab members and post them in the lab. Download the premade sign.

2 Points

E.3: Host a lab clean up event

- Once a year, host a lab clean out. Identify equipment, chemicals, and other supplies that are no longer needed and dispose of them appropriately. This may include identifying other labs that may need your unwanted items.

E.4: Green Lab Champion schedules a routine meetings with lab members to discuss progress of sustainability initiatives

- It can be helpful to have periodic green lab meetings to discuss progress and areas for improvement.

E.5: Lab members received recognition of sustainability efforts

- Periodically, identify members of your lab team that have shown exemplary performance and effort towards green lab ideals.

E.6: Refer another lab to the Green labs Certification program

- Encourage others to participate in the Green Labs program. Communicate who you talked to and their interest level to the Green Labs Committee sustainability@villanova.edu

E.7: Develop materials to share lab sustainability efforts

- Share your sustainability success with others, through your website, papers, presentations, and more. Green Lab certification can set you apart in the grant application process and presentation requests.

Waste

1 Point

WS.1 Collect and recycle electronic waste

- State law prohibits the disposal of electronic waste through the traditional waste stream. All electronics that have a plug must be recycled through appropriate sources.
- Villanova has an electronic recycling program. If you have unwanted electronics please fill out a work order.

WS.2 Locate paper recycling bins next to all trash cans and/or printers

- It is well documented that recycling rates increases when recycling bins are located next to trash. Additionally, if you have a printer in your lab a paper recycling bin should be within close proximity.
- Villanova has a paper recycling program, if you need a paper recycling bin please fill out a work order.

WS.3 Recycle ink cartridges

- Spent ink cartridges can be easily refilled, or recycled into new products.
- Villanova has an ink cartridge recycling program, if you need a paper recycling bin please fill out a work order.

WS.4 Collect and recycle used batteries

- Batteries contain harmful chemicals that should not be put into a landfill or incinerated.
- Villanova has a battery recycling program, if you need a paper recycling bin please fill out a work order.

WS.5 Collect oils and lubricants

- For labs that use and produce oils and solvents, look for ways to collect and reuse the excess.
- Villanova will collect and recycle any unwanted oils and lubricants, contact Eric Welsh.

WS.6 Display signage for recycling

- Recycling signs help people understand what they can and cannot recycle and where.
- Display pre-made signs from the Green Labs website in your laboratory.

WS.7 Reuse items when practical

- Though it can difficult to reuse lab equipment, there are some instances when reuse is accepted.
- Find what can be reused in your lab, and educate your colleagues. Provide documentation on what and how you were able to reuse a particular item that you hadn't in the past.

WS.8 Eliminate all personal printers

- Personal printers are less efficient than larger centralized printers, both in energy usage and ink usage.
- Remove all printers from the lab area and utilize an existing centralized printer. Special considerations will be made for dot matrix printers, or lab equipment that requires specific printers.
- A lab can qualify for this credit if they have already eliminated personal printers from the lab.

WS.9 Set printer defaults to duplex and black and white

- One piece of paper takes 2.6 gallons of water to make!
- Double sided printing is an easy way to reduce your labs water footprint. Display the Green Lab efficient paper printing sign.
- All University printers should be set to print double sided, if your printer does not automatically print double sided contact UNIT for support. For the College of Liberal Arts and Science, contact CLASSIT@villanova.edu and for all others contact Support@Villanova.edu.

WS.10 Use the pipette refill option

- Instead of replacing the whole pipette box, use the refill option. This cuts down on waste and saves your lab money.

Waste

2 Points

WS.11 Identify a waste stream the lab wants to reduce and make efforts to minimize
- This can pertain to any waste stream, recyclable or not recyclable, with the goal of reducing that waste by at least 10%.
- Provide documentation on the selected waste stream, what actions were taken to reduce waste, and how you measured the waste reduction.

WS.12 End unwanted mailings and request electronic versions of laboratory catalogs
- Reducing mailings can help save paper, as well as energy.
- Though it may seem painful, calling up your unwanted mailers can do a lot of good for the planet.
- Using an electronic laboratory catalogue can make finding and organizing your order easier than traditional paper catalogues.
- Check to see if your laboratory supply has an online store and if so unsubscribe to the paper version.

WS.13 Reduce document margins
- Margins can be useful for taking notes, but many times they serve as wasted space.
- Chose the narrow margins when printing, you will be surprised how much paper you can save.

WS.14 Educate staff and students on proper recycling practices
- Don't just display signs. Talk to your staff and students about the new programs and why it's important.
- Use these helpful recycling facts that may help make recycling relatable:
  - Five plastic bottles (PET) recycled provides enough fiber to create one square feet of carpet or enough fiber to fill one ski jacket.
  - Recycling a single aluminum can saves enough energy to power a TV for three hours.
  - Making paper from recycled paper reduces the related contribution to air pollution 95%.
  - Glass can be recycled and re-manufactured an infinite amount of times and never wear out.
  - The average American uses seven trees a year in paper, wood, and other products made from trees. This amounts to about 2,000,000,000 trees per year!

WS.15 Search ChemTracker for chemicals you need
- Search ChemTracker for other labs in your department that have the chemical you need. For outside your department, contact Eric Welsh.

WS.16 Exchange mercury thermometers for other types
- Exchange your old mercury thermometers with EH&S for new thermometers without mercury. Contact Eric Welsh.

Waste

3 Points

WS.17 Collect, reuse and/or recycle glass, plastic and metal containers

- Not all lab work generates plastic or metal waste that can be conventionally disposed.
- First try to reuse containers in your own lab, you may be surprised how much they come in handy.
- If you have extra glass solvent bottles please contact your waste coordinator or Cian Watts.
- If your lab does generate plastic or metal container waste (including pipette boxes) from non-hazardous chemicals, please complete the container recycling application. After application review, approved labs will be contacted by Recycling Ric for program setup, which will include a separate bin and signage for the lab.
- Chemistry and Biology labs can work with their support staff to recycle empty containers. Contact Eydiejo Kurchan for Chemistry and Lindsay Bair for Biology.

WS.18 Collect and return packaging to suppliers

- Certain lab equipment suppliers will take back their package to be recycled or reused.
- Contact your suppliers to see if they will take back packaging.
- Innovation credit if you find another collection waste stream other than pipette racks.

WS.19 Reuse packing material

- Much of what supplies come packed in can be reused for later shipments.
- If you have room in your lab, store packing material for a later use, or stop by Eydiejo's office (Mendel 312) to pick up reused packing supplies.

It takes 2.6 gallons of water to make one piece of paper

Materials

1 Point

MA.1 Coordinate purchases to minimize packaging
- Partner with other labs when ordering supplies to reduce overall packaging, resulting in fewer emissions and energy associated with transporting your purchase.

2 Points

MA.2 Maintain an inventory of supplies to check before ordering additional supplies
- Up to date supply inventory can help keep your lab organized and save you money.

MA.3 Purchase items with recycled content
- Items made out of recycled material require less energy and material waste in manufacturing.
- When ordering lab supplies look for products that contain recycled content (ideally post-consumer recycled content), such as paper, plastic or rubber products.

MA.4 Use chlorine free paper
- The chlorine used by the paper industry pollutes the water and air of the surrounding area.
- When buying from Office Basics chose SKILCRAFT Process Chlorine Free Copier Paper (look for the one with recycled content)

MA.5 Use GelRed/GelGreen or Sybrsafe instead of EtBr

MA.6 Share supplies to reduce extra quantities
- When appropriate, identify people or labs that you can share supplies with in order to reduce the number of excess supplies. For example: glassware, pipettes, etc.

MA.7 Designate an area for office supply reuse
- Start by cleaning out your office and identifying items for reuse or recycling. Store reusable supplies in a common area.

3 Points

MA.8 Use rechargeable batteries
- Rechargeable batteries use less chemicals over the life time of the battery and are easier to recycle.

MA.9 Use green cleaning products
- Green cleaning products contain less harmful chemicals, making them safer for the user and the environment.
- When purchasing cleaning products, looks for ones that are Green Seal certified, or low VOC.

MA.10 Use or reusable dishes in common room/break room
- Despite having to clean reusable dishes over their life cycle, permanent dishes require less water and energy than disposable dishes.

MA.11 Use recyclable laboratory ware
- Paper, plastic and metal are easily recycled, so long as they are not contaminated with harmful chemicals.
- Since every lab is different, please submit a proposal for lab ware recyclability in your application.

MA.12 Purchase furniture that is reused or manufactured with recycled content
- Check with your building manager for extra campus furniture for your lab.
- All manufactures will list whether a product is made with recycled content.

Chemical Use & Storage

1 Point

C.1 Annually register your lab through Environmental Health and Safety (EH&S)
- Download and complete the registration form. Send completed forms to Eric Welsh.

C.2 Schedule and attend an Environmental Health and Safety (EH&S) annual laboratory walk through
- Contact Alice Lenthe from EH&S to schedule your safety lab walk through.

C.3 Work with volatile chemicals in the hood only
- For safety purposes, work that may result in chemical odor or toxic fumes should be done under the fume hood.

C.4 Containers of volatile substances are capped when not in use
- Capping and properly storing volatile substances helps to reduce lab health hazards.
- Villanova has a chemical storage classification resource for labs in appendix E.

C.5 Use of mercury-free reagents and equipment whenever possible
- Reducing mercury in the lab helps reduce health risks to lab members.
- Use these resource for how to reduce mercury in your lab.

2 Points

C.6 Complete inventory (or annual update) of all laboratory chemicals in ChemTracker
- At least annually update your inventory

C.7 Conduct training on proper chemical management for lab members
- Use the Chemical Hygiene Plan provided by EH&S as a guideline for your lab training.
- The 12 Principles of Green Chemistry provide helpful ideas for the lab.

C.8 Reduce the purchase and use of hazardous chemicals in the lab
- Keep your lab safe by reducing your use of toxic or hazardous chemicals. Look for alternatives to more hazardous chemicals and purchase only as much hazardous chemicals as you need.
- Identify alternatives to hazardous chemical usage, MIT's Green Chemical Alternatives Purchasing Wizard is a great resource.

3 Points

C.9 Develop a program to remove and properly dispose of obsolete chemicals
- Assess your labs yearly chemical needs and aim to purchase chemicals that will be depleted by the end of the year.

C.10 Redesign a chemical reaction to reduce the need for chemicals
- Green chemistry methods can include, but are not limited to computer simulations and micro-scale chemistry technique when applicable.
- Utilize the 12 principles of Green Chemistry, to identify new ways to reduce your laboratory chemical usage.
- For more information about green chemistry.

Equipment

1 Point

EQ.1 Size new equipment appropriately

- When buying new or reassessing current equipment, make sure you are using equipment that is efficient and meant for the purpose you are using it for. For example, incubators that are used in replace of a refrigerator can use 5-10 more energy than a refrigerator.
- Assess equipment usage and see if you can share your equipment with others.

EQ.2 Remove space heaters

- Typical space heaters use around 1.5 kW of energy. This is around 10 times more energy than the average refrigerator. If you run a space heater for only 2 hours a day 5 days a week you will be contributing over 300 lbs of carbon dioxide into the atmosphere which is the equivalent of burning over 16 gallons of gas.
- If you have a space heater, switch it for a more energy efficient one, see examples below, or get rid of it and wear warm clothing when cold.
    - Infrared Heaters
    - Floor mat heaters

EQ.3 Turn off equipment when not in use (as appropriate)

- Equipment that takes 30-45 minutes to reach operating standards, such as ovens, gas chromatography machines, and centrifuges, should be turned off when not in use.
- Refrigerated centrifuges should be used only to maintain appropriate temperatures during run time, and should be turned off once the experiment is completed.
- Turn off biosafety cabinets when not in use, allow the fan to run for 5 minutes unobstructed before starting work and 5 minutes before turning the cabinet off.
- "Turn me off" reminder stickers are available through the Sustainability Office.

EQ.4 Efficient use of freezers

- Set freezers to the temperature required for what it is storing. Raising the freezer temperature can lengthen the life of the freezer's compressor (reducing the frequency of freezer purchases) and save energy. Raising the temperature of a freeze from -80 to -70 degrees can save up to 30% of its energy use.
- For more information you can review "Everything you Wanted to Know about Running an ultra-low Temperature Freezer Efficiently but were Afraid to ask…"
- Only store samples as needed in the freezer. Remove old samples from the freezer and when possible store dehydrated DNA and RNA samples at room temperature.

EQ.5 Run autoclaves and dishwashers when full

- Autoclaves use a lot of energy and water, running them only when full will save on both over time. Consider partnering with another lab to make sure you have enough items to fill the washer.

EQ.6 Share equipment

- Depending on your lab needs you may consider sharing equipment with other labs, such as ice machines, freezers and fridges.
- One of the labs must give up their equipment in order for both labs to qualify for this credit.

Equipment

2 Points

EQ.7 Display signage for proper shutdown procedures
- You know your lab equipment best, develop shutdown procedures for your more temperamental equipment and display them in your lab.

EQ.8 Conduct an appliance audit to eliminate any unnecessary personal computers/refrigerators/equipment
- Any identified unnecessary equipment should be recycled, please fill out a work order.

EQ.9 Consolidate freezer space
- If you have extra space in your freezer consider sharing with another lab.
- Alternatively, if you have a handful of compact freezers, consider consolidating them into one larger freezer, saving energy and space.

EQ.10 Defrost freezers annually to prevent ice buildup
- The freezer compressor runs longer to maintain temperature when ice builds up around the coils, resulting in higher energy usage.
- Defrost freezer when it has 2cm thick ice buildup, and vacuum the outside condenser coils.

EQ.11 Develop an archival plan for freezer samples to get rid of expired samples
- Getting rid of expired samples will reduce risk of using them during experiments, and saves valuable freezer space.

EQ.12 Buy and sell used equipment if possible
- When looking for new equipment consider buying them used, which tends to be cheaper and saves resources.
- For unwanted lab equipment, consider selling it for reuse.
- Some sites to look at: LabX, Ebay, Bio Surplus, Aaron Equipment, Lab Merchant, and Amazon.

3 Points

EQ.13 Implement routine maintenance program for laboratory equipment
- Proper equipment maintenance saves energy and extends the live of the equipment
- Clean coils, filters and motors regularly.
- This credit does not qualify for freezers, as their maintenance is addressed in another credit.

EQ.14 Use a timers on operating equipment
- Preset timers will automatically turn off equipment after a certain amount of time. This solution is not applicable for all lab technology, but can help with the smaller items, such as fans, chargers, etc.

EQ.15 Replace refrigerators that are older than 7 years
- Look for Energy Star certified refrigerators/freezers, which save at least 10% more energy than the minimum federal standards, without compromising performance.

EQ.16 Ensure all new equipment is Energy Star certified
- When looking for new lab equipment, check for Energy Star certified options.

Energy Efficiency

1 Point

EE.1 Turn off lights when leaving a room

- If your lab does not have occupancy or vacancy sensors for the room lights, place a green labs reminder sticker next to the light switch.

EE.2 Use multi-level light switches and standby lights appropriately

- If your lab has multiple lighting levels use only the amount of light needed for a given task. Excess light is not good for the environment or your eyes.

EE.3 Enable energy saving settings or power save mode on equipment

- Some newer lab equipment comes with an energy saving mode.
- All computers come with a power save mode option.
  - For short periods of time, set the computers to turn off the display after 10 minutes, and put the computer to sleep after 30 minutes.
  - Turning off your computer when not in use for more than 2 hours not only saves energy, but also preserves the life of the computer.

EE.4 Keep fume hoods lowered

- Fume hoods are traditionally a lab's highest consumer of energy because of the high volume of conditioned air it produces. Keeping a fume hood closed, even on constant speed drive hoods, saves energy because the hoods move less air when closed. Newer hoods with variable speed drives, reduce energy consumption by 60-80% when closed.
- Put the Green Lab's "shut the sash" sticker on your hood, contact sustainability@villanova.edu for a free sticker.

EE.5 Close windows and doors if the HVAC system is on

- Opening windows while the HVAC is on allows conditioned air out of the building, wasting a lot of energy.
- If your space is uncomfortable put in a work request.

2 Points

EE.6 Smart use of daylight

- Enjoying natural lighting is great for energy savings and mental health. For some labs, natural light can help reduce the need for artificial light, but make sure you are getting enough light. For other labs you might have too much direct sunlight causing the lab to heat up. In those cases, lower the shades during the middle of the day to avoid temperature swings.

EE.7 Use power strip and/or turn off chargers when not in use

- Many electronic devices use phantom energy when plugged in, even when they are not in use.
- Power strips with an easy on and off switch make it easy to "unplug" items that suck phantom load, such as chargers, and anything with a stagnant light.

EE.8 Clean and organize lab spaces, including inside the fume hood, to reduce ventilation needs

- A clean space and vents improve air flow and reduce energy demands on the HVAC system.

3 Points

EE.9 Use task lighting rather than overhead lighting

- Task lighting uses less electricity than overhead room lighting, as well as provides concentrated light on your work space.
- Make sure task lighting is equipped with either an LED or CFL light, reducing energy needs and excess heat loss.

Water

1 Point

WT.1 Report maintenance issues through the Work Request System

- Small maintenance issues over time can lead to substantial waste: leaky faucets can waste more than 3,000 gallons of water a year.
- When you see something that needs to be fixed in your area put in a work request through the Villanova work order website.

WT.2 Turn off the faucet when not in use

- Small steps, like turning off the faucet when it's not in use, can save a lot of water.
- Make sure to communicate this effort with your staff through signage and direct communication.
- Check to see if your faucet has an aerator, which can reduce water usage up to 50%.
  - Submit a work request if your faucets don't have aerators.

WT.3 Enable water saving mode on water using equipment

- When possible set lab equipment to the water savings setting. Depending on the type of equipment this can save thousands of gallons of water a year.

2 Points

WT.4 Use appropriate water quality

- Manufacturing high quality water requires a substantial amount of energy and water.
- Consider what quality of water is required for each stage and weather soaking rather than continuous flushing is adequate.

•WT.5 Wash equipment efficiently

- Make sure to communicate these practices with your staff. Use this resource from UCSB.

Field Work

1 Point

FW.1 Recover batteries and electronics

- Both batteries and electronics contain harmful compounds that are damaging to wildlife if released into the environment.
- Follow a "carry in, carry out" policy for all field work.

FW.2 Include sustainability considerations in the Field Safety Plan

- Add an additional element(s) to your field work safety guidelines that addresses sustainability. Please provide documentation of your revised safety guidelines.

2 Points

FW.3 Recover and reuse flagging and staking material

- In most cases, flagging is made out of non-degradable plastics, that will forever live where it is left.
- Try to use compostable staking and flagging, and/or collect items once testing is completed.

FW.4 Reuse or recycle sample containers

- When appropriate recycle or reuse sample containers.

FW.5 Reduce travel impacts

- Identify ways to reduce travel impact through alternative transportation. Consider:
  - Carpooling
  - Public transit
  - Bicycle
  - Carbon offsets (Native Energy)
  - Consolidate the number of trips