2025-26 STEM LAB SAFETY MANUAL
Please read before completing Safety Quiz

General Lab Procedures and Safety Guidelines

1.) Working in the lab is a privilege, not a right. Please be respectful of our shared space, of the tools and equipment, and one another when here. The lab is not a place to goof off or the fool around in.
2.) All students approved to work in the lab after school must read the safety procedures, and get a 100% score on the STEM Lab Safety Quiz. You must also have a parent or guardian sign your safety contract. These are kept on file, newly, for each school year.
3.) When entering the STEM Lab, first ensure that you have closed toed shoes.
4.) Store your personal belongings in a cubby near the lab entrance.
5.) Sign in on the STEM Lab sheet with your name, date, and the time you are in the lab.
6.) If you would like to use any of the tools in the lab, please consult Mr. Lewon or Mr. Shubiak first. You will need to sign the tool(s) out and then sign them back in when you are done using them. If you need to be safety trained on a piece of equipment or tool you have not used previously, Mr. Lewon, Mr. Shubiak, or a STEM Tech will train you.
7.) If you cannot reach or cannot safely move a piece of equipment or a piece of wood from the wood stacks, you MUST ask for help.
8.) Upon completion of your time in the lab, please make sure that you clean up your area and put all tools away. Put simply, leave it as you found it, so that it is clean for the next person.
9.) Any projects that need to be stored in the lab should either be placed in a personal locker (first come first serve), or in the back closet. If placing in the back closet, please let Mr. Lewon or Mr. Shubiak know so that we can make sure there is room, and that the path to the electrical panels is clear for the maintenance staff.
10.) When leaving the lab for the day, please sign out.
11.) Note, if leaving when lab is closing for the day, you must help with final cleanup, which includes sweeping the floors and wiping down surfaces. Any rogue tools or equipment must also be put back where they belong.

General Dust Room Procedures and Safety Guidelines

1.) When using the dust room you must **remove your lanyard and any loose fitting clothing, such as things with baggy sleeves or hoodie strings. Long hair must be tied back.**
2.) Use a pair of safety goggles from the lab's supply, and a pair of hearing protectors.
3.) Sign in on the dust room use sheet, located on the door.
4.) Turn on the two air ventilation units using the remote hanging on the side of the back cabinet.

5.) If you need to be safety trained on a piece of equipment or tool you have not used previously, Mr. Lewon, Mr. Shubiak, or a STEM Tech will train you.
6.) When you are done working in the dust room, please vacuum up any sawdust and clean up by throwing away all scraps, putting tools back where they should be, and shut and unplug any machines that you may have used. Please leave the dust room as you found it, so that it is clean for the next person.
7.) When done, please sign out of the dustroom with the time.

Bandsaw Safety Procedure

1.) Follow General Dust Room Safety Procedures!
    a.) Eye protection, hearing protection, remove lanyards and loose clothes. Tie back long hair.
    b.) Sign in to the dust room
    c.) Turn on air ventilation system.
    d.) Let Mr. Lewon or Mr. Shubiak know which machine you will be using (safety training will be provided if needed).
2.) Turn on dust collector in back left corner, and open the tubing that is connected to the bandsaw.
3.) The bandsaw is for use on wood, pvc, and acrylics. No metals.
4.) Plug in bandsaw.
5.) Unlock bandsaw button,
6.) Line up your material with the central blade. Adjust guide as needed to ensure the material sits flush to the side rail. Make sure to lock the adjuster.
7.) Do not turn on the machine until you are sure that you are lined up correctly.
8.) Turn on the bandsaw and let the blade come up to speed.
9.) Using a piece of scrap wood, push the material towards the siderail. Use another piece of scrap wood to push the material, slowly, through the bandsaw blade to make your cut.
10.) Once the cut is complete, turn the bandsaw OFF. DO NOT go near the blade while it is still running!
11.) Never put your hands near the blade. If, while running the bandsaw and making your cut you feel like you need to readjust the piece of wood or the jig, turn off the bandsaw before making the adjustment. Resume ONLY when everything is locked down and in place safely to allow you to make your cut without putting your hands anywhere near the blade.
12.) When done, re-lock the bandsaw and turn off the dust collector.
13.) Unplug bandsaw.
14.) Clean up the bandsaw station, to leave it as clean as you found it.
15.) If done in the dust room, sign out.

Chop Saw Safety Procedure

1.) Follow General Dust Room Safety Procedures!

a.) Eye protection, hearing protection, remove lanyards and loose clothes. Tie back long hair.
b.) Sign in to the dust room
c.) Turn on air ventilation system.
d.) Let Mr. Lewon or Mr. Shubiak know which machine you will be using (safety training will be provided if needed).

2.) Turn on dust collector in back left corner, and open the tubing that is connected to the chop saw.

3.) The chop saw is for use on wood. No metals or plastics.

4.) Plug in chop saw

5.) If necessary, adjust the angle of the cut using the mechanism at the front of the saw.

6.) Place wood flush against the back side of the chop saw. Then use attached clamps to secure the piece of wood to the saw's base.

7.) Line up your piece of wood material with the blade. WITHOUT pressing the button, lower the handle down to ensure where the blade is contacting your piece of wood. If you need to adjust the position, unclamp, adjust, and then securely reclamp before testing again.

8.) Grasp the handle, and hold down the button. With a smooth downward motion, lower the blade through your wood to make the desired cut. Once through, raise the handle slowly and release the button. Do not put your hands ANYWHERE NEAR the blade during use.

9.) When done using, unplug the chop saw and turn off the dust collector.
10.) Clean up the chop saw station, to leave it as clean as you found it.
11.) If done in the dust room, sign out.

Chemical and Spray Paint Use Safety Procedures

1.) Always ask either Mr. Shubiak or Mr. Lewon if you are allowed to use any of the chemicals or paints from the flammables cabinet. Then sign them out.
2.) If using chemicals such as epoxy or resin, clear off a workstation, and put either cardboard or safety mats on the station first, before taking out supplies. Open windows in the lab to properly ventilate.
    a.) Always use a fumes mask and eye protection (gloves recommended as well).
    b.) Follow ALL instructions associated with the chemical you are using, and if you are unsure, consult Mr. Lewon or Mr. Shubiak before proceeding.

c.) Place all epoxy or resin based projects in dust room to solidify.

3.) If spray painting, you will be instructed to either use the dust room or to go outside.
    a.) Always use a fumes mask and eye protection.
    b.) If in the dust room, open all windows, turn ventilation system on, and put cardboard down on the ground. You must spray and leave your item to dry on this cardboard.
    c.) If outside, take item to be painted to the concrete slab across the path. When you bring your item back in, lay down cardboard in the dust room and place the item on the cardboard to dry.
4.) When done, put chemicals or paints back in cabinet (signing them back in as well). Clean your workstation thoroughly and put all table protectors back. Wash hands thoroughly.
5.) Clean out fumes mask/respirator with lysol solution to disinfect and hang on back wall hook to dry.

Laser Printer Safety Procedures

1.) Sign in for laser printer use. You may only use it if you have been sufficiently trained.
2.) Turn on ventilation switch located on the left side of the printer, on the wall.
3.) Turn printer on.
4.) Place material in the printer bed, lining it up with the top left corner.
5.) Adjust height of bed to calibrate material to the printer
6.) Turn on the air compressor in the back room.
7.) Set up your print on the computer, and send it to the laser printer.
8.) Adjust on screen parameters to desired printing output.
9.) Run print.
10.) When done with the printer, please turn off the air compressor, and clean out any scraps from the bottom of the printer bed. Then sign out of using the printer.

Jigsaw / Sawzall

1.) Always ask permission before using either the Jigsaw or the Sawzall in the lab. Sign out which you will be using. Asking permission enables either Mr. Lewon or Mr. Shubiak to ensure that you are using the correct tool for the right job.
2.) Please use the Jigsaw or Sawzall in the dustroom, and follow all dust room safety guidelines.
    a.) Eye protection, hearing protection. No loose fitting clothes or lanyard. Long hair tied back.
    b.) Ventilation system on.
3.) Make sure the blade is securely in place in either the jigsaw or sawzall.

4.) Have material you will be cutting securely attached to a fixed surface, so that it will minimize movement and vibration.

5.) Keep fingers away from the blade. Only hold the jigsaw or sawzall by the trigger handle. One hand may be placed on the body of the tool, away from the blade, in order to help guide the cut more precisely.

6.) When done, please clean up your area in the dustroom. Please leave it as you have found it.

7.) Put the tool back into storage and sign the tool back in.

General Hand Tool Safety

1.) Always ask permission before using any hand tools in the lab, and sign tools you will be using out. Asking permission enables either Mr. Lewon or Mr. Shubiak to ensure that you are using the correct tool for the right job.
2.) Wear eye protection, and remove lanyard when working with hand tools.
3.) The following are instructions for some of the more dangerous hand tools. Improper use of any hand tools will necessitate a suspension from using the lab.

a.) Hammers

For hammers, make sure that the right hammer is used for the right purpose. When driving nails, a smaller clawed hammer should be used. Always hold nail with non-dominant hand and begin tapping the nail in using firm, but small taps until the nail gets a hold. Then remove hand and begin driving in nail with straight and firm strokes of the hammer.

b.) Metal snippers

Wear eye-protection. Always make sure the item that you are holding is secured, either by a vise or a clamp to another fixed surface. Never hold the piece you are cutting with your hand, in order to avoid injury. Using both hands, use the snippers on the area of the material that you would like to cut, keeping hands away from blades. When complete, always lock the snippers with the safety latch before returning it to the drawer.

c.) Utility knife

Only use on top of plastic work table protectors.
When using, never cut towards yourself. Always away.
Hold material that you will be working on firmly with non-dominant hand, and use the dominant hand to make your cut, keeping other fingers away from the blade.
When done with utility knife, you must either replace the safety cap on the end of it, or retract the blade into the handle before returning it to the drawer.

d.) Wood Tools

Please wear eye protection, and remove loose clothing. Tie back long hair and remove lanyards.

Pick a workspace with access to a wood-sided vise.
Secure wood tightly between vise clamps.

If using a saw - Wear work gloves and saw in a downward motion away from yourself, back and forth. Do not try to go to fast or the wood may split, or the saw may ‘buckle’.

If using a wood-plane - Ensure, especially, that the wood you are working on is firmly gripped in the wood vice. Use work gloves, and use both hands on the plane, cutting with a forward even motion across the wood.

If using wood carving tools - Avoid placing fingers near carving blades. Use small vices if necessary in order to be safe with fine work, to avoid finger or hand injuries.

Forge Safety

1) Always ask permission and sign-in to the dust room before using the forge. Asking permission enables either Mr. Lewon or Mr. Shubiak to ensure that you are working safely and efficiently.
2) Obtain the following pieces of safety equipment:
    a) Safety goggles (located at the front of the lab, near the entrance, in the large box on the wall)
    b) A forging apron (located either in the cabinet near the entryway to the lab or beneath the forge in the dust room)
    c) Forging gloves (located either in the cabinet near the entryway to the lab or beneath the forge in the dust room)
        i) You may want two pairs: a pair of tight work gloves and a pair of forging gloves
3) Follow General Dust Room Safety Procedures, such as removing your lanyard and/or tying your hair back.
4) Clear the space around the forge for work, making sure to remove anything flammable (paper, oil, wood, etc.) from the nearby vicinity. Additionally, clear the space within the forge to ensure the propane flow isn’t blocked, nothing was left in the forge, etc.
5) Turn on the propane gas by turning the valve on the propane tank all the way “Open”.
6) Turn the valve on the regulator to the recommended setting. This can be adjusted afterwards, but it’s best to start low and work your way up in terms of heat..
7) Use a long lighter or the acetylene torch to ignite the propane inside the forge; point the end where the fire comes out near the opening of the forge and click the trigger. **Be careful to stand some distance away, as the propane could ignite faster than expected.**
8) Always use tongs when moving objects in or out of the forge; **metal does not need to be glowing to be hot.** Ensure you have a tight grip with the tongs before removing

anything from the forge. Typically, you will want to grab the cooler end with the tongs so that you can work the hot end on the anvil.

9) Do not touch the hot end of the metal to anything other than an anvil.
10) Ensure personal space and safety while working; forging often sends sparks and loose bits into the air while you are working. Remain calm, work purposefully, and ensure everything is under your control (grip, flames, dyes, etc.).
11) Please inform Mr. Shubiak, Mr. Lewon, or one of the STEM Techs if the forge is not working properly or the propane has run out. Do not attempt to fix anything yourself.

Drill Press Usage and Safety

1) Obtain the following pieces of safety equipment:
    a) Safety goggles (located at the front of the lab, near the entrance, in the large box on the wall)
2) Obtain the following materials and equipment:
    a) Oil, contained in a tin can near the drill press (there should be a brush in the can as well)
    b) The magnetic clamp, found near the drill press; it is a large metal block with a clamp that can be tightened via screws
3) **NEVER place your hand(s) beneath the drill press while it is on. Be extremely careful even when the device is off.**
4) If you need to change the drill head, you will need the key and a new drill head, found in the containers near the drill press. The key allows you to loosen, as well as tighten, the clamp on the drill head so that you can interchange it.
5) Place the object you wish to drill into the magnetic clamp and tighten the screws. Ensure the object cannot move or rotate.
6) Place the magnetic clamp within the drill press; the magnets should hold the clamp in place while you work.
7) Line up the drill to your intended position before turning on the drill press. You can use the wheel on the right side to lower the drill and check for accuracy.
8) Once you are fully setup, turn on the drill press using the switch on the left side and slowly lower the drill using the wheel.
9) Use the brush to apply oil to the drill as you work, possibly working with an additional person. This is particularly important if you are using a thin drill or are drilling into dense materials.

Power Sander Usage and Safety

1) Always ask permission and sign-in to the dust room before using the power sander. Asking permission enables either Mr. Lewon or Mr. Shubiak to ensure that you are working safely and efficiently.
2) Obtain the following pieces of safety equipment:

    a) Safety goggles (located at the front of the lab, near the entrance, in the large box on the wall)
    b) Forging and/or work gloves (located either in the cabinet near the entryway to the lab or beneath the forge in the dust room)
    c) A forging apron, depending on the material you are using (located either in the cabinet near the entryway to the lab or beneath the forge in the dust room)
3) Follow General Dust Room Safety Procedures, such as removing your lanyard and/or tying your hair back.
4) **NEVER touch the sandpaper while the machine is on and the wheel is spinning. Be extremely careful with your hands even when the device is off.**
5) Check and clear the area around the power sander, especially if you plan on sanding a large piece.
6) Once you have your piece ready, turn on the power sander using the switch on the right side.
7) **There are two sanding surfaces: the line of sandpaper on the front, which is useful for grinding at angles or irregular shapes, and the circular pad on the right side, which is useful for sanding flat surfaces. Be careful of your hands as your work, such that you do not touch one of the surfaces while using the other.**
8) Try to hold the piece such that your hands are as far away from the sandpaper as possible without losing your grip. You will need to apply forward pressure as well as hold the piece as the paper attempts to push it.
9) Do not push full force into the paper; instead apply constant, even pressure across your piece. The process will take time, and it is better to be patient and work properly rather than try to rush. You could put your piece, or worse yourself, at risk by rushing.
10) Work with sandpaper of lower coarseness as you progress through the process. Start with rough, low grit paper and work your way to fine, high grit paper. When working with wood, you may only need to use coarse sandpaper.
11) If the sandpaper needs to be changed, please inform Mr. Lewon, Mr. Shubiak, or one of the STEM Techs as soon as possible. Do not attempt to change it yourself.

Power Grinder Usage and Safety

1) Always ask permission and sign-in to the dust room before using the power grinder. Asking permission enables either Mr. Lewon or Mr. Shubiak to ensure that you are working safely and efficiently.
2) Obtain the following pieces of safety equipment:
    a) Safety goggles (located at the front of the lab, near the entrance, in the large box on the wall)
    b) A forging apron (located either in the cabinet near the entryway to the lab or beneath the forge in the dust room)
    c) Forging and/or work gloves (located either in the cabinet near the entryway to the lab or beneath the forge in the dust room)

3) Follow General Dust Room Safety Procedures, such as removing your lanyard and/or tying your hair back.
4) **NEVER touch the grindstone while the machine is on and the wheel is spinning. Be extremely careful with your hands even when the device is off.**
5) Check the area around the power grinder to ensure no flammable materials are around. Grinding metal produces sparks, and materials such as sawdust, paper, and oil could be serious fire threats.
6) Ensure the plastic protection screens are tightly screwed in place and are relatively clean.
7) Once you have your piece of metal and are ready, turn on the power grinder using the switch on the front.
8) Try to hold the piece such that your hands are as far away from the grindstone as possible without losing your grip. You will need to apply forward pressure as well as hold the piece as the wheel attempts to push it.
9) Do not push full force into the stone; instead apply constant, even pressure across your piece. The process will take time, and it is better to be patient and work properly rather than try to rush. You could put your piece, or worse yourself, at risk by rushing.

Heated Tools (Hot Glue Gun, Heat Gun, etc.) Safety and Usage

1) Always ask permission before using a heated tool, as it keeps Mr. Lewon and Mr. Shubiak at the ready to deal with any dangers that come with heat.
2) Obtain the following pieces of safety equipment:
    a) Safety goggles (located at the front of the lab, near the entrance, in the large box on the wall)
    b) Plastic (located near the sink) and/or work gloves (located either in the cabinet near the entryway to the lab or beneath the forge in the dust room), depending on the project
3) For the sake of these devices, follow General Dust Room Safety Procedures, including removing your lanyard and tying your hair back.
4) **Always be careful when working with a heat element, as the danger of burning yourself or objects is very real. If you burn your skin, notify one of the teachers in charge and apply cold water to the affected area.**
5) **Never point the heating element at another person, even as a joke; you will have your privileges revoked.**
6) In most circumstances, you should work on a surface that will not be damaged by the heat or is meant to be destructible. Plastic sheets, packing paper, or similar objects need to be set up before beginning work.
7) Work at a safe distance from the piece and try to use intermediary items rather than touching the piece itself, such as using tweezers, wooden sticks, or pipe cleaners.
8) Make sure there is air flow through the work space; heat often produces odors or dangerous gasses. If you are ever unsure, wear a breathing apparatus in addition to your safety goggles.

9) Always allow both the piece and the equipment to cool after use. Any electronics used to produce heat must be turned off and, in most cases, unplugged.

3D Printer Safety and Usage

1) Sign-in on the 3D printer log, making note of which printer you use and how large of a project you are printing.
2) Should the print time exceed a limit (c. 4 hours), you may be asked to pay for replacement filament. Please check with Mr. Lewon or Mr. Shubiak should you wish to print a large/complex project.
3) For the sake of these devices, follow General Dust Room Safety Procedures, including removing your lanyard and tying your hair back.
4) Clean the work surfaces as best as possible, including removing stuck-on bits of filament. If the surface is torn or ruined, let Mr. Lewon or Mr. Shubiak know.
    a) Masking or painter's tape is a quick fix that should not damage the work surface; you may lay down a layer on the work surface **before** it heats up.
5) **The filament and work surface will be hot while the project is printing and shortly after it has completed; please be careful to not touch the heating elements. Use work gloves and tools, such as scrapers, to handle the print while it is hot. Otherwise, allow the device and the project time to cool before handling.**
6) There are a number of reasons a project may fail to print; should you notice that your print is not coming out as expected, it is best to Cancel the print, check the temperatures and programs, and retry the print.
    a) If you need help getting a project right, feel free to ask one of the STEM Techs, Mr. Shubiak, or Mr. Lewon.
7) For information regarding the use of the smaller 3D printers (*MP Select Mini 3D Printer*), see
    a) "Setting up Cura for Monoprice Mini": Setting up Cura for Monoprice Mini
    b) "Setting up a 3D print in Cura": Setting up a 3D print in Cura.docx

Power Drill Safety and Usage

1) Please confirm with the acting teacher or one of the STEM Techs that you are allowed to use a power drill. They can also aid you in choosing the right area to work in, the proper drill bit to use, etc.
2) Obtain the following pieces of safety equipment:
    a) Safety goggles (located at the front of the lab, near the entrance, in the large box on the wall)
    b) Work gloves (located in the cabinet near the entryway to the lab)
3) For the sake of these devices, follow General Dust Room Safety Procedures, including removing your lanyard and tying your hair back.
4) Acquire one of the battery packs, typically found on one of the chargers. Make sure the battery pack matches the power drill you are using.

    a) When you are finished using the drill, return the battery pack to the charger.
5) **Never point the head of the drill at another person, otherwise you will have your privileges revoked. Additionally, do not point the drill at any object you do not attempt to drill into. Be careful with your hands around the device.**
6) There are numerous drill bits in the lab; if you are unsure about the location of what you need, feel free to ask the acting teacher or one of the STEM Techs.
7) Take care of the drill, the drill bits, and the screws you use. Try not to strip the drill bit or your screws by pressing too hard with the drill, continuing to spin the drill despite it not having a grip on the screw, using the wrong drill bit, etc.
8) If you assume your work will create a mess, consider working within the dust room rather than the main lab.

Cleaning Protocols and Safety

1) There are 3 primary forms of cleaning:
    a) *Physical:* sweeping sawdust, wiping up dye, throwing away stray papers
    b) *Chemical:* dissolving solidified resin, wiping up alcohols or chemicals
    c) *Organization:* returning tools to their proper places; organizing screws, nails, drill bits by size; moving the stools into out-of-the-way positions
2) Physical
    a) After most projects, please sweep and vacuum your work space and the surrounding area. Please empty the vacuum after use in one of the large trash cans located throughout the lab.
    b) Collect up any larger pieces and either place them in the trash or return useful pieces to the supply.
    c) Look out for materials that affect the environment, such as slippery fluids or overly dusty rooms.
    d) If there was anything spilled that is safe to handle, please wipe up the mess with paper towels and dispose of the mess properly.
3) Chemical
    a) If you are working with dangerous materials, the active teacher(s) will aid you in cleaning up.
    b) You should be wearing goggles, gloves, and possibly a breathing apparatus to use and clean any dangerous chemicals.
    c) Alcohols, such as ethanol and isopropanol, are to be used sparingly and under controlled circumstances. Please ensure there is air flow before using an alcohol to clean. **Do NOT ingest the alcohols; additionally, do not spray the alcohols at another person.** Always use gloves and wear goggles while working with an alcohol.
        i) Ethanol is relatively safe and may be useful for removing stains, helping with small messes, and washing away Sharpie ink.

ii) Isopropanol can be dangerous and requires supervision. Isopropanol can help dissolve certain plastics and organic materials, including resin. Please check with Mr. Lewon or Mr. Shubiak before use.
iii) Acetone is dangerous and may only be used by Mr. Lewon or Mr. Shubiak. Breathing protection is required when working around acetone. Acetone can dissolve most plastics, as well as a number of other materials. If there is a circumstance where you think you may need acetone to clean something, please ask the acting teacher to do it for you.

d) Always check for reactivity before mixing two chemicals; this can be done by searching the two materials into Google and asking the active teacher.

4) Organization
   a) Return tools to their properly labeled containers. If you are unsure where a tool belongs, ask the acting teacher or a STEM Tech for assistance.
   b) Return unused materials to their respective locations.
      i) If there are usable pieces of waste, also return those to the supply.
   c) Make sure there are no loose papers or objects left in the room or on the desks.
   d) Push the stools beneath the desks, such that the walkways are free of clutter.