



Environmental Health and Safety

Introduction to the Experiment Hazard Assessment Tool

The purpose of the Experiment Hazard Assessment Tool is to assist researchers with incorporating safety fundamentals into an experiment, thus creating an improved, safe and complaint work environment. This is accomplished by identifying hazards and the controls to mitigate or eliminate such hazards. (Common hazards include: Asphyxiation, Cancer, Electrical shock, Eye injury, Hearing loss, Infection, Poisoning, Reproductive organ damage, Repetitive Strain Injury, Respiratory disease, Skin burn, Skin cut and abrasion, Skin disease, Traumatic blood loss and Whole body trauma from explosions, falls, falling objects.) When planning an experiment, while the outcome is often unknown, the equipment, materials, processes and methods are well defined. Using the Experiment Hazard Assessment Tool in conjunction with the A-Z of Laboratory Safety at Tufts Guide, researchers should understand all applicable hazards, whether minor or major and be comfortable with implementing the correct controls to mitigate these prior to beginning work.

The completion of the Tool should be based on an experiment PROTOCOL. You write a protocol to ensure that you have a definite plan for conducting the experiment. This protocol is typically written in your laboratory notebook (paper or electronic). The protocol for your experiment should identify every piece of equipment, all materials, specific processes and step-by-step methods for performing each task. Using your protocol, mark "YES" or "NO" for each hazard. Those that are marked "YES" should be described and have identified control(s) noted. Amongst other resources, utilize reference documents cited within the Tool and/or contact Tufts Environmental Health and Safety for assistance. Once complete, the filing of the Tool is the discretion of the lab, so long as it is easily assessable to researchers performing the experiment.

Name of scientist or person designing the experiment: _____

Title of the experiment protocol: _____

Campus: _____ **Building:** _____ **Room:** _____ **Date:** _____

Complete this Checklist before beginning each different laboratory experiment, laboratory exercise or Standard Operating Procedure.

<u>General Equipment Safety</u>		<ul style="list-style-type: none"> • <i>Locate, Read and Understand Operating Instructions and note potential hazards of each piece of equipment as stated by the manufacturer See A to Z guide for Equipment Instructions for Use.</i> • <i>Be sure to procure all required PPE as stated by the manufacturer for safe use. See A to Z guide for Personal Protective Equipment.</i> • <i>Label all inoperative or damaged equipment and notify responsible person for repair by a qualified person.</i> 		
Specific Hazard Created	Yes	No	Describe	Controls in Place
Electrical: Does equipment in experiment have High Voltage over 600V or potential for exposure to unguarded live parts greater than 50V			<i>Describe using A to Z guide for Electrical Hazards and Lockout/Tagout as a reference</i>	
Machinery: Use of Equipment with pinchpoints, nip points, rotating parts (fans etc.) or other point of operation hazards.			<i>Describe using A to Z guide for Mechanical Hazards and Shop Equipment as a reference</i>	
Robotics: Use of equipment with Robotics that typically perform more than one task than a machine would.			<i>Describe using A to Z guide for Robotics as a reference</i>	
Temperature Extremes: Will equipment involve hazardous temperature extremes: cold or heat			<i>Describe using A to Z guide for Temperature Extremes as a reference</i>	
Noise: Will equipment create loud noise over 85 dBA?			<i>Describe using A to Z guide for Noise Exposure as a reference</i>	

<i>Specific Hazard Created</i>	<i>Yes</i>	<i>No</i>	<i>Describe</i>	<i>Controls in Place</i>
Vibration: Will equipment create loud noise over 85 dBA?			<i>Describe using A to Z guide for Vibration as a reference</i>	
Reaction/Process Vessels: Will chemical reactions, coatings, depositions be done in a vessel container etc.?			<i>Describe using A to Z guide for Pressure Vessels as a reference</i>	
Fluids: Does the equipment used have fluids that can leak?			<i>Describe using A to Z guide for Personal Protective Equipment and Chemical Spills as a reference</i>	
Vacuum: Does the equipment use vacuum?			<i>Describe using A to Z guide for Vacuum Systems as a reference</i>	
High Pressure: Does the equipment create or use high pressure in a vessel such as autoclave?			<i>Describe using A to Z guide for Pressure Vessels (including autoclaves) as a reference</i>	
High Magnetic Field: Does the equipment create high magnetic fields?			<i>Describe using A to Z guide for High Magnetic Fields as a reference</i>	
Materials used in Equipment: If not already answered above does the experiment involve the use of materials in equipment? Does it release such materials?			<i>Describe using A to Z guide for Electrical Hazards as a reference</i>	

<i>Specific Hazard Created</i>	<i>Yes</i>	<i>No</i>	<i>Describe</i>	<i>Controls in Place</i>
Material Handling Equipment: Is heavy duty equipment such as cranes or fork trucks used in or to support the experiment?			<i>Describe using A to Z guide for Heavy Material and Equipment as a reference</i>	

Specific Equipment

<i>Specific Topic</i>	<i>Yes</i>	<i>No</i>	<i>Describe</i>	<i>Controls in Place</i>
Sharps - Does experiment use items such as needles, scalpels, and glass which can be broken?			<i>Describe using A to Z guide for Sharps and hypodermic needles as a reference</i>	
Explosion Proof/Resistant Cold Storage - Does experiment require the need for flammables to be stored or brought to cold temperature?			<i>Describe using A to Z guide for Explosion Resistant/Proof Refrigerators as a reference</i>	
Cold/Warm Rooms - Will experiment use Environmental Chambers and other types of walk-in storage with temperature control?			<i>Describe using A to Z guide for Environmental Chambers/Walk-in Refrigerators as a reference.</i>	
Fume Hood- Will experiment require fume hoods to control exposures to chemical agents?			<i>Describe using A to Z guide for Fume Hood as a reference.</i>	
Biosafety Cabinet- Will experiment require Biosafety cabinets used to control exposures to biological agents?			<i>Describe using A to Z guide for Biosafety Cabinet as a reference.</i>	

Materials

<i>Materials Used</i>	<i>Yes</i>	<i>No</i>	<i>Describe</i>	<i>Controls in Place</i>
Biohazardous and Microbial Agents: Review TU/TMC Biosafety Manual to determine if the agents must be registered with the Institutional Biosafety Committee (IBC); http://viceprovost.tufts.edu/ibc/ ; Human Source Material: blood or human tissue cells			<i>Describe using A to Z Guide for Bloodborne Pathogens and A to Z Guide Laboratory Coat, and A to Z Guide Eye Protection as a reference</i>	
Plant and Plant Material: Will experiment use plants or plant derived materials?			<i>Describe using A to Z Guide for Plants as a reference</i>	
Animals and Animal Derived Materials (include invertebrates): Will experiment use animal or invertebrate derived toxins, allergens, sensitizers, infectious agents?			<i>Describe using A to Z Guide Animal Handling Safety, A to Z Guide Select Agents & Toxins, and A to Z Guide Sensitizers as a reference</i>	
Anesthetic Agents: Will any anesthetic agents such as Isoflurane be used in the experiment?			<i>Describe using A to Z Guide Anesthetic Agents</i>	
Recombinant and Synthetic DNA (rsDNA): Will experiment use artificially formed DNA?			<i>Describe using A to Z Guide Recombinant DNA and Synthetic DNA (rsDNA) as a reference</i>	
Nanomaterials: Will the experiment use Nanotechnology?			<i>Describe using A to Z Guide Nanotechnology as a reference</i>	

<i>Materials Used</i>	<i>Yes</i>	<i>No</i>	<i>Describe</i>	<i>Controls in Place</i>
Controlled Substances: review TU Controlled Substances Policy and ensure that a Permit for possession and use is current. http://publicsafety.tufts.edu/ehs/controlled-substances/			<i>Describe using A to Z Guide Controlled Substances as a reference</i>	
Compressed Gas: Will compressed gases be used in the experiment?			<i>Describe using A to Z Guide Compressed Gas as a reference</i>	
Cryogenic Liquids: Will cryogenic liquids be used?			<i>Describe using A to Z Guide Cryogenic Liquids and A to Z Guide Personal Protective Equipment</i>	
High Hazard Chemicals: review Safety Data Sheet, TU Chemical Hygiene Plan and complete Registration form and written Safety Plan http://publicsafety.tufts.edu/ehs/chemical-hygiene/			<i>Describe using A to Z Guide High Hazard Chemicals, A to Z Guide Mutagens, Teratogens, A to Z Guide Poisons, A to Z Guide Reactives, A to Z Guide Laboratory Coat, A to Z Guide Eye Protection, A to Z Guide Safety Data Sheets, and A to Z Guide Safety Plan for High Hazard Chemicals</i>	
Mercury: Will mercury or compounds containing mercury be used?			<i>Describe using A to Z Guide Mercury as a reference</i>	
Experiment Waste: Will experiment generate biohazardous, pathological, or chemical waste?			<i>Describe using A to Z Guide Regulated Medical and Biological Waste, A to Z Guide Pathological Waste, A to Z Guide Chemical Waste, and A to Z Guide Satellite Accumulation Area as a reference.</i>	
Batteries: Will Batteries or equipment which runs of batteries be used?			<i>Describe using A to Z Guide Batteries and Battery Charging</i>	

Logistical Issues

<i>Specific Topic</i>	<i>Yes</i>	<i>No</i>	<i>Describe</i>	<i>Controls in Place</i>
Minors- Will minors be performing any of portion of the experiment?			<i>Describe using A to Z guide for Minors in the Laboratory as a reference</i>	
Transportation - Does experiment involve the need to transport materials intracampus, intercampus or off-campus?			<i>Describe using A to Z guide for Shipping Hazardous Material as a reference</i>	

Processes

<i>Specific Topic</i>	<i>Yes</i>	<i>No</i>	<i>Describe</i>	<i>Controls in Place</i>
Repetitive Motions Will repetitive motions such as hand pipetting be performed in the experiment			<i>Describe using A to Z guide for Ergonomics as a reference</i>	
Lifting Heavy Material/Equipment Will the need to lift heavy equipment or materials be needed to perform the experiment?			<i>Describe using A to Z guide for Heavy Material and Equipment Handling as a reference</i>	
Controlling Hazardous Energy: Will the experiment require controlling hazardous energy such as electrical, pneumatic, hydraulic to protect researchers from exposure			<i>Describe using A to Z guide for Lockout Tagout as a reference</i>	

<i>Specific Topic</i>	<i>Yes</i>	<i>No</i>	<i>Describe</i>	<i>Controls in Place</i>
Chemical Waste Disposal - Does experiment involve the need to dispose chemicals			<i>Describe using A to Z guide for Chemical Waste, Satellite Accumulation Area, and Sinks and Sanitary Sink Disposal as a reference</i>	
Chemicals becoming Airborne - Does experiment involve the chance for airborne emission of chemicals due to volatility, heating or spraying that have a GHS hazard of 1-3?			<i>Describe using A to Z guide for Fume Hood, Personal Protective Equipment, and Safety Data Sheets (SDSs)</i>	
Other processes - Does experiment involve other processes not mentioned above?			<i>Describe the hazards of these processes using A to Z guide for Job Hazard Analysis to assist you.</i>	