

Safety Handbook 2019-2020



Passion

Leadership

Community

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1 What is Safety?

1.1 Why Safety is Important

Safety is the action of taking precautions against potential risks and injury. It is not just a way to behave, it is also a culture and a set of personal beliefs.

Safety is crucial for the success and well being of every member of Red Alert. When someone is unsafe, they endanger themselves, those around them, and the supplies we need to create robots. We teach that safety is not just about keeping yourself safe, those around you safe, but also about making sure you don't damage the equipment you are using.

Safety rules are designed for three reasons: to keep you safe, to keep others safe, and to protect things from damage. If you build a strong foundation in safety, then you set yourself, and your team, up for success. When safety is established, mentors are able to focus on helping students grow and learn instead of exhausting efforts to stop unsafe behavior before any permanent damage is done.

1.2 Our Safety Culture

At Red Alert, safety is a culture. Not only is safety encouraged, but it is a part of everything that we do. From our fun and unique safety initiatives to the safety subteam we implement all year, we have shaped the culture of our team to emphasize the importance of safety.

The skilled, older team members can also use these valuable skills to train other, newer members. With safety drills occurring, we can ensure that every member knows what to do in case of an emergency. Every drill, we aspire to receive a time faster than the last. We also do training, like battery spill kit training, to guarantee the safety of all our team members. All students are required to take a variety of safety tests, including general shop safety and machine safety.

The overall culture of our team is safety. We all know how important it is that safety is not only seen as important, but that it is a reflex. Our plan is that our culture becomes compelling to other teams, so it can inspire others to emphasize safety to its full potential.

2 Responsibility

2.1 Who is Responsible?

Everyone on the team is responsible for the team's safety. Safety is a culture and should be enforced by every single member. If someone is not following the safety rules, whether they are from our team or not, it is the job of whoever sees the safety violation to politely tell that individual to fix their violation.

3 Minor Injuries and How to Avoid Them

3.0 Overview

In case of emergency, please refer to the front of the safety manual. For lesser injuries, please find the relevant section. If there is an injury not covered in the safety manual, please seek a mentor immediately. In any injury case, find a safety team member and/or a mentor to make sure that the injury is properly handled and the damage is minimized. Please follow all rules and guidelines put in place to ensure your safety, the safety of those around you, and the protection of property.



3.1 General Shop Rules

Proper Shop Attire:

- Safety glasses must be worn AT ALL TIMES
- Hair tied back so it does not extend over the shoulder
- Long pants (Jeans are preferred)
- No loose clothing
- Sweatshirt strings or other loose items must be tucked away
- Lanyards must have a clip around the neck in order to be able to be worn
- Close-toed shoes

Horseplay Rules:

- NO running
- Hands to yourself
- NO messing around with machinery
- Do NOT throw tools to one another

Proper Machine Use:

- Always pay attention to your surroundings
- Make sure a mentor is present for required machines.
- Each machine has different hazards; know them and avoid them
- Use the correct and safest machine for the material you are using
- Do NOT leave machines running when not in use
- NEVER walk away while a machine is still in motion, even if it's off



Other General Rules:

- Clean up your area when you are done working
- Know where all of the three Emergency Stop buttons are located
- Pay attention, no matter what you are doing

3.2 General Pit Rules

Proper Pit Attire:

- Same as *Proper Shop Attire* above

Horseplay Rules:

- Same as *Horseplay Rules* above

Working on Robot Rules:

- ALWAYS pay attention to your surroundings
- Put away your tools after they are done being used
- Do not touch the robot if it is enabled
- If you are not working on the robot while it is being fixed, step to the side to avoid being in the way of those who are working
- NEVER stick your hand in a moving robot part
- Do NOT leave your tools in the robot or lying around

Other General Rules:

- Handle the batteries with care (2 hands on the base)
- Know where all of the fire extinguishers are located
- Pay attention, no matter what you are doing
- Only 5-6 students in the pits at all times

3.3 Cuts and Scrapes

Cuts and scrapes are any break of the skin. It does not necessarily bleed but it does open the skin for infections. Always be sure to clean a cut or scrape with warm soapy water and antiseptic before covering with a bandage. Tell a mentor, or someone trained in first aid, if you have any cuts or scrapes.

To avoid cuts and scrapes, assume everything is sharp. If it looks sharp, it is. Wear gloves when handling any metal, plastic, or wood. Try to avoid attempting to "squeeze" between things as this often leads to scrapes. Wearing long pants is also a nice way to protect your legs; although this is not technically a safety rule, it is an added shop and pit rule on Red Alert.

3.4 Burns

A burn is an injury caused by exposure to heat or flame. The signs of a burn would be pain, redness, blistering, swelling, and a wet appearance. 1st-degree burns are painful and run the risk of infection, but do not usually require excessive care. 2nd-degree burns are the most painful and are very serious; they do require specialized care and immediate medical attention. 3rd-degree burns are the most serious since that is when the nerves are severely damaged. It is important to take care of burns right away to avoid the risk of infection which can complicate things significantly. Tell a mentor if you have any burns

The biggest way to prevent burns is to keep flammable things, especially clothing, away from anything that could spark or ignite. It is also important to take note that machines often get hot when moving and operating; this also applies to plastic and metal that is being cut. Always handle plastic and metal with care and wear gloves.

Chemical burns are less common, but easily prevented. Do not pour chemicals without proper safety clothing and goggles. If at all possible, avoid any handling of harmful chemicals, and seek help from a mentor. If you notice an unknown substance that is spilled, get gloves before cleaning it up. If you drop a battery, make sure to add gaff tape, state when you dropped it, and state that it is not usable. In case you drop a battery and acid spills out, there are battery spill kits located around the shop. The locations can be found under *3.9 - Emergency Map*.

There are instructions located on the side of the battery spill kit. Use it if necessary. Be sure to notify a mentor. See Appendix 5.1 for specific instructions.

3.5 Splinters

Splinters are when a foreign object, usually wood or metal, breaks off and embeds itself under the skin. Although splinters are a lesser injury, they can turn serious if left untreated. Splinters run a high chance of becoming infected, which causes various other complications. Be sure to remove the splinter and clean the wound thoroughly. Tell a mentor if you have any cuts or scrapes.

Splinters are easy to avoid. Always wear gloves when handling wood, metal, and plastic. Be aware of the grain of wood and try to avoid running your hands against the grain. If you notice the edges of a piece of metal or wood are rough, sand it down.

3.6 Entanglement

Hair getting caught in anything rotating is a serious issue that is easily avoided. Hair can get ripped from the scalp leaving an exposed, even bloody mess behind. If the hair is not ripped from the scalp it can pull your face into moving objects or towards danger. This is a much bigger issue.

For hair that is longer than your ears, keep it out of your face with bobby pins or barrets, even if you are a guy. For hair that is longer than your collar of your shirt, tie it back with a hairband and pin back any loose strands. For hair that is past your shoulders, tie it up in a bun so that when you lean down, no hair comes to the front of your body, and as always pin back any loose strands.

Make sure to keep your hoodie strings tucked-in to prevent getting trapped. Similar to hair entanglement, hoodie strings can get caught and lead to injuries.

3.7 Trapped or Pinched Limbs and Fingers

Objects are constantly moving in the pits and shops, which means there is a risk for your fingers, toes, hands, feet, arms, and legs to get trapped or pinched in these moving parts or objects. This is very dangerous.

Always be aware of your surroundings. Do not try to “squeeze” through places and avoid reaching into an area that has a moving part, i.e into a robot that is still powered on. Always make sure there is someone near you that can help you if you need to lift or move something.

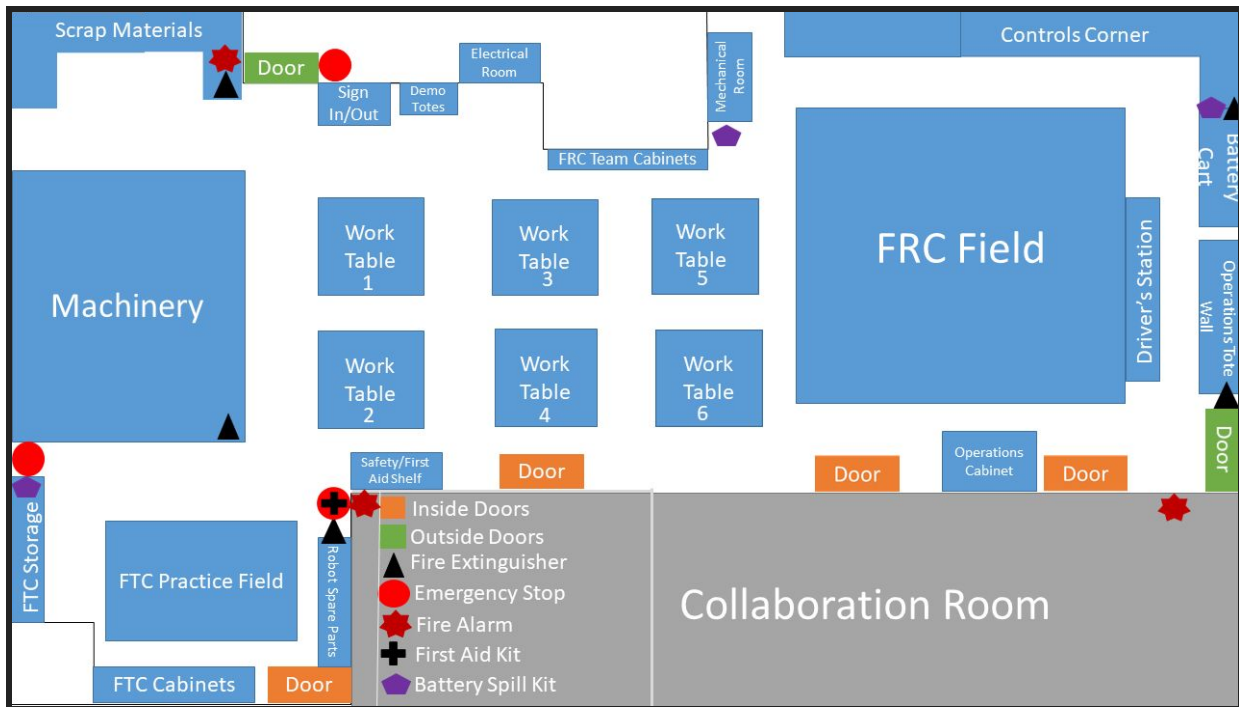
3.8 Broken Bones

The pits are often busy and fast-paced during competitions. Though breaking a bone is unlikely, it can happen. If there is a broken bone, it is important to know how to handle the situation.

- If they're bleeding, elevate and apply pressure to the wound using a sterile bandage, a clean cloth, or a clean piece of clothing.
- If you suspect they've broken a bone in their neck or back, help them stay as still as possible. If you suspect they've broken a bone in one of their limbs, immobilize the area using a splint or sling.
- Wrap an ice pack or bag of ice cubes in a piece of cloth and apply it to the injured area for up to 10 minutes at a time.
- Help them get into a comfortable position, encourage them to rest, and reassure them. Cover them with a blanket or clothing to keep them warm.
- Call 911 or help them get to the emergency department for professional care.

3.9 Emergency Map

This map was created to locate items for an emergency. For example, the emergency stops can be shown in this image. Be sure to find and ask a mentor for help if you cannot find what you need.



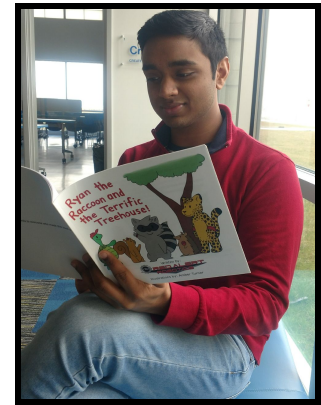
4 Having Fun and Being Safe

4.1 Safety Children's Book

To further our impact, and plant the idea of a safety culture into the minds of our younger community members, five years ago we published our own children's novel: "Ryan the Raccoon and the Terrific Treehouse".

This book was entirely written and illustrated by Red Alert Robotics members from the 2015 year. It tells the story of Ryan, a raccoon, who wants to build a treehouse for him and his friends. In order to build the treehouse, however, Ryan must learn the rules of safety.

We bring our book to all of our demos and outreach events in order for everyone to get a chance to read it and experience our Red Alert safety culture. The project has proven to be effective, since many kids seem to love reading our books at demos, and we have even asked parents if we were ever planning on putting this book out on the market.



4.2 Safety Glasses Sign

A key part of being safe, both in the shop and in the pits, is having safety glasses on at all times. Whether or not an individual is working on a robot, it is crucial to have safety glasses on at all times, just in case a part or random fragment comes flying off from anywhere around you.



In order to place an emphasis on the importance of this component of safety, we wanted to remake our signs for safety glasses around the shop during the 2018-2019 season. One of our sponsors, Exhibithouse, who made the sticker decals for our toolboxes, offered their assistance with designing and creating the sign for both our shop and within our pits. We were able to work alongside them in order to bring our

vision to life. We created a (roughly) 22"x32" sign, which lights up on the white areas, and displays our rule with safety glasses: they are required at all times.

This 2020 season will have a new and improved safety system. With more and more of our members learning about the importance of safety, we will be able to work on our robot while minimizing our chance of liability. This will help the mentors assist the building of the robot rather than focusing on injuries and safety.

4.3 Safety Test

In order to implement our safety culture throughout the team, we make sure that every student understands the basic safety rules through our safety tests.

Every member must take a general safety test. This test includes rules such as the proper attire in the shop and pits, as well as basic safety rules that anyone on the team should know. Any member who plans on using a machine at any time must also pass a machining test. This is a much more extensive test that assesses how to use all of the machines in the shop. It covers the importance of kickbacks, clamps, etc. The machines included in this test: mill, lathe, sander, hand drill, drill press, vertical bandsaw, horizontal band saw, and the chop saw.

Every member must get 100% on the general safety test. If the member plans on using a machine, they must receive an 80% on the machine safety test. Team members are also required to complete all UL Safety Certifications for the season.

These tests are an important piece of ensuring that team members understand how vital safety is in everything we do.

4.4 UL Safety Ambassadors

At one of our events during the past 2018-2019 Season, a UL Safety Advisor asked our safety team if we had heard of the UL Safety Ambassadors. We immediately began research and worked to make our whole team Safety Ambassador certified. The entire idea and curriculum of this program encourages safety in every aspect of life.

In between our two district events and our District Championship, we had two outreach events, one at the Children’s Museum of Indianapolis, and one at a local library. At both of these demos, we brought coloring pages of the Safety Smart Compass, which is a part of the Wild About Safety curriculum taught through the Safety Ambassador experience (this is shown in the image to the right). Having this available at these events allowed the children and other attendees to ask us about our safety culture, and what this compass actually meant. It was a fun and exciting way to integrate safety into our outreach, and to grow the appreciation for safety that it deserves.

Another way we incorporated the curriculum of Safety Ambassadors in the short time is through our signs that we had posted throughout the venue. We had posted fun signs with Timon and Pumba, who led the Wild About Safety videos, reminding people of simple tasks, such as staying hydrated.

During our 2019-2020 season, we will test all the new rookies and get them Safety Ambassador certified. That way, they can help teach the young members in the future and make sure they are safe at all times.



4.5 Emergency Drills

During this season, we will ensure the safety of others by teaching them what they should do. During emergencies, like a fire or a tornado, people must be sent to a particular location. This is why we will continue practicing drills. Some examples of the drills we do here at Red Alert are: fire, tornado, code yellow, code red, and many more.

During a **Code Yellow**:

- Lock all doors
- Notify everyone
- Do not let anyone in or out without mentor permission
- Continue normally until notified by a mentor

During a **Code Red**:

- Stop what you are doing
- Head to the **bathrooms**
- Mentors should lock all doors
- Roll call
- BE SILENT
- No phones unless notified by a mentor
- Wait until the all-clear is given by a mentor

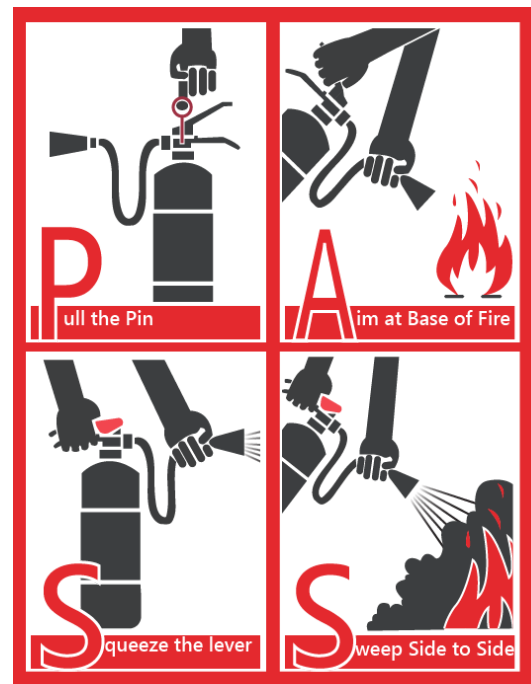
During a **Tornado Drill**:

- Stop what you are doing
- Head to the **bathrooms**
- Roll call
- Wait until the all-clear is given by a mentor

During a **Fire Drill**:

- Stop what you are doing
- Walk calmly outside, NO SHOVING
- Walk towards the **salt barn**
- One mentor clears all areas of the shop, including restrooms, before exiting the building
- Wait until a mentor instructs you on what to do

Sometimes avoiding an emergency is impossible. This is why we will teach everyone what they should do during an emergency. That way, their safety can be ensured.



5 Appendix

5.1 Battery Spill Procedure

5.2 2020 Incident Reports

5.3 2020 Drill Reports

5.4 General Safety Test

5.5 Machine Safety Test

5.6 2020 UL Safety Ambassador Training

5.7 **FIRST Safety Checklist**

5.8 Corrective & Preventive Action Plan

5.9 Competition Posters