



Castle Robotics
Team 6498
Safety Manual



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1.0 Mission and Purpose

The mission of Castle Robotics Team 6498 is *Safety Is Everyone's Responsibility*. We take the safety of our students and mentors seriously and will continually strive to become a positive example for other teams in our area. This manual is to be used by members (made up of students, mentors and parents/guardians) of Team 6498 in conjunction with the most current official FIRST Safety Manual. It will include policies and procedures specific for working in the Castle Robotics Room (RR), policies and procedures specific for event competition, and policies and procedures for community outreach and promotional events. Also included are some basic first aid instructions as well as blank copies of compliance logs and checklists. This manual will be reviewed and updated on a yearly basis by the Team 6498 Safety Committee.

2.0 Safety Committee

The Safety Committee was created to provide a structure for the safety program of team 6498. The Safety Committee is tasked with maintaining all aspects of the team safety program. The committee includes at least two mentors; the Safety Mentor and the Lead Technical Mentor as well as one student representative as Safety Captain. The committee should also include the Robotics Coach and/or Teacher Sponsor. If the Safety Captain is not a member of the fabrication team, another student selected and approved by the safety committee will be added who has been a member of the fabrication team for at least one year and has a high attendance record.

2.1. Committee Meetings

The Safety Committee meets regularly to assess the safety program and to evaluate compliance and injuries. It is at the discretion of the Lead Technical Mentor or Safety Mentor to determine when these meetings are held.

3.0 Safety Materials

3.1 First-Aid Kits and Automated External Defibrillator (AED)

The team's first-aid kits are an integral component of the safety program. The first-aid kit includes all components necessary to treat injuries ranging from simple cuts, scrapes, and splinters, to burns and lacerations. The team currently has one primary first-aid kit to be located in the pit during events, and to be placed to the right of the sink during the rest of the year.

A small travel kit that contains the basics is brought to all community outreach and promotional events that includes a robot and is kept with the spectators during FIRST events under the scoring table. This small kit is not used in the RR and is stored to the right of the sink.

First aid kits are restocked as needed, and an inventory is taken at least once a year, to replace outdated supplies. Free first-aid kits obtained in previous years are dated and stored in the safety supply cabinet and may be used by members as well. A diagram of the RR, safety cabinet and first-aid location is located in Appendix A.

The AED is in the main school hallway on the cafeteria side, if CPR is required.

3.2 Personal Protective Equipment (PPE): Eye Protection

Each member of team 6498 is assigned a pair of ANSI-approved safety glasses. The glasses are stored in one of two plastic over-the-door storage hangers. These glasses are numbered and each number on the glasses corresponds with a number on plastic pocket assigned to each member. Prescription glasses must have safety glasses worn over them unless ANSI approved.

There are eyeglass retainers available for members without prescription safety glasses to hang them around their necks when not needed. They are stored in the safety cabinet unless required by a member. From then on, they stay on the glasses as long as the member uses them. At events, they are kept with each member as they enter and leave the pit area.

3.3 PPE: Hearing Protection

Ear plugs are available to team members as needed. Each member is assigned ear plugs and are stored with their safety glasses. Five noise reducing headphones are available and are stored in the safety cabinet. Certain machines come with a label, warning members that hearing protection is required. Plugs will be available in the pit during competitions as well.

3.4 PPE: Hand Protection

Work gloves are available in the RR for members to use for work that requires them. If lifting something heavy, such as the robot, gloves are required. Follow directions as given for each piece of equipment. Disposable medical gloves are also available for team members who require them. Anytime a person is treating the injury of another member, they must wear medical gloves, regardless of the type of injury. When students are painting or staining wood, it is recommended that they wear these gloves as well. Both types of gloves are stored in the safety cabinet.

3.5 Battery Spill Kit

The team has a fully stocked battery spill kit available located in the black pit cart between the sink and the storage cabinet. At competition, it remains in this cart. Battery spill kit instructions are located in Appendix B.

3.6 Fire Extinguisher

The team has an up-to-date, category ABC fire extinguisher. The fire extinguisher is located in the RR and is easily accessible to everyone in case of emergencies. In the pit, it is located on the stand located in the front right of the pit by the exit where it is easily accessible by all in the pit. Each team member is informed of its presence, location, and how to use it. Locations are shown in Appendix A.

3.7 Eye Wash Station

There is a small eyewash station that is hanging above the sink in the RR. This station will be made available at FIRST events and will be next to the first-aid kit.

3.8 Hand Sanitizer

Hand sanitizer is available in the RR during the build season and in the pit and stands during competitions.

4.0 Safety Documentation

To highlight gaps in training and compliance, it is important to keep accurate safety records. It will increase good safety habits and lower the incidence of injury and sickness.

4.1 Safety Data Sheets (SDS)

Team 6498 stores SDS for all chemicals, paint, and batteries in a binder at the First Aid Station and during competitions, in the pit. The Safety Committee is tasked with reviewing and updating all SDS that are kept by the team.

4.2 Signage

Larger power equipment has signage on the wall near them with important safety considerations for use. Signage does not replace individual member training on each piece of equipment.

4.3 Injury Log

To maintain proper accounts of injuries, all injuries must be written down as an entry in the injury log. This simple log requires the basic details of the injury including the date of the injury, the injured person's name, what the injury was, and the basics of how it was treated. Each entry is cross-checked with Injury Reports to maintain accurate records. A blank injury log is available in Appendix D. Completed logs are stored in the business and media team's office. These can be filled out by the Safety Captain, Safety Mentor, Lead Technical Mentor or anyone in the Safety Committee.

4.4 Injury Report

The injury report is a detailed form filled out at the time of any **significant or serious** injury. This form requires detailed descriptions of the incident and actions taken, as well as signatures from those present. **The report needs to be brought to the school nurse at the start of the next school day.** A copy of the report will be sent with the student home to be signed by a parent, so they acknowledge the injury. The student is not allowed in the RR or FIRST events until the form is returned. A blank copy is available in Appendix E. These can be filled out by the Safety Mentor, Lead Technical Mentor or any adult in the Safety Committee.

4.5 Electronic Records

The Safety Captain is tasked with keeping electronic records of all injuries, reports, and training of members within the team, as well as up to date contact information for parents/guardians in case of an emergency. It is up to the Safety Captain's discretion how these records are maintained, but all members of the Safety Committee must have access to these files.

4.6 Communication

Any member may identify a safety concern or suggest a new policy. These suggestions and observations are the key to keeping the safety manual current and up to date. Suggestions will be discussed and approved by the safety committee as needed. Every member will have access to the Safety Captain and Safety Mentor's email to report concerns or send pictures of positive and negative safety actions of the team.

4.7 Safety Checklist

It is the responsibility of the team Safety Captain to create a safety checklist for use in the pits during competition. This list should include all the things that must be done to clean the pit and keep it safe throughout the day. The checklist is in Appendix F.

5.0 Student Health Information

To create the most effective safety program for all team members, the Safety Committee collects relevant health information on students.

5.1 Collection of Information

Before competition season, all students must provide all relevant medical and personal information about themselves which includes but is not limited to allergies, illnesses, and emergency contact information. This information is collected and stored by the Safety Mentor with the assistance of the Lead Business and Media Mentor. This information is brought to each competition.

6.0 Safety Training

To make sure that all students on the team are properly familiar with the safety policies, they must go through safety training.

6.1 Safety Workshop

Every fall, a safety training conducted by the Safety Captain and the Safety Mentor to team members, this presentation includes all the basic rules of the team and information included in the team safety manual and the FIRST safety manual.

6.2 FIRST Safety Manual

Every fall, all students must read the official FIRST Safety Manual, which is posted on the Castle Robotics website (see Team Safety section). It provides additional safety requirements each team member must know to keep themselves and others safe at practices and competitions. It is updated every year.

6.3 FIRST Safety Training Modules

Every fall, each team member must complete the FIRST Student Learning modules assigned by Castle Robotics. Additional information about creating a student account in the FIRST Safety Learning Portal will be provided by the team.

6.4 Equipment Training

Members must go through hands-on training sessions in the RR to learn how to use, clean and store every piece of equipment they will be using. The safety mentor or lead technical mentor must sign off on the Safety Training Checklist when completed. The only exception is if they have been trained in the past year by their Industrial Technology Instructor. That teacher can sign them off. Students will have a chance to practice their skill in front of a mentor. An engineering mentor and student will sign off on the training for each applicable machine and date it. This is kept in Appendix E of this manual.

6.5 Safety Test

After completing the Safety Workshop, students must take and pass a safety test. If a student fails the test, they may retake it once more. If they fail it again, they must retake the Safety Workshop before being allowed another chance at the test. Students must pass the safety test before being allowed to enter the RR. Copies of completed safety tests for the current each year are available in Appendix G of the safety manual.

6.6 Safety Contract

Students and their guardians must read and sign a contract stating that they know and will follow all safety rules given to them. A copy of the team Safety Contract is available in the appendices.

6.7 Non-Compliance

While every effort will be made to ensure proper safety rules are followed, it will take time to learn and use the safety principles outlined in both manuals. Coaching is the preferred style of training and reinforcing safety procedures for Team 6498. All members should use calm and encouraging style of conversation to correct minor safety infractions with others (For example, "Tie your laces," can be said kindly and quickly to the student who always seems to have laces undone). Though errors should be corrected as soon as they are seen, no one should be shamed or harassed when making them.

Serious infractions such as horseplay or continuously engaging in unsafe behaviors will result in a meeting with the Safety Captain and/or Safety Mentor. A behavior plan, with the member's approval, may be put in place, outlining policies and procedures specific to that member. Parents/guardians will be informed if any individual meetings take place with their child and what the outcome of the meeting entailed, including a copy of the behavior plan. Records of these meetings will be kept locked, accessed by the Safety Mentor and Lead Technical Mentor.

It is important to understand that both not reporting injuries and willful disregard to the policies and procedures of either the FIRST Safety Manual or the CRC Safety Manual could result in expulsion from the team.

7.0 General Safety Rules

- I will use safety glasses and any other necessary safety gear at all times in work areas during builds.
- I will wear appropriate clothing in the robotics room.
- I will only use equipment that I have been trained on.
- I will use caution and common sense while working and tell a mentor if any tool or equipment is malfunctioning.
- I will be responsible for proper care and maintenance of tools and equipment, and only use tools for their intended purpose.
- I will always clean up after using any tools and place them in the proper locations.
- I will look out for the safety of others and always encourage safe conduct, especially while driving the robot.
- I will report any injuries to the team leaders or mentors.

8.0 Team Clothing Policy

The following are the team's rules regarding what is permitted to be worn in the RR during build season and when members are actively building during off-season.

8.1 Footwear

All footwear of anyone entering the RR must be closed-toed and securely fitted to the foot. If there are laces, they do not drag onto the floor or hang and swing as they walk. Closed-toed shoes are required for all outreach/summer events.

8.2 Clothing

Pants must be longer than knee length, but short enough that they do not drag on the floor. No baggy clothing in the RR unless tucked in. Long sleeves must be rolled or pushed up past the elbow when operating machinery.

8.5 Jewelry

Hanging jewelry should not be worn by anyone using a power tool or piece of equipment.

8.6 Hair

If a member's hair is past their shoulders and they are using a power tool or piece of equipment, their hair must be pulled back and secured with a hair tie.

9.0 Handling Injuries – Minor

9.1 Oversight and Implementation

While all students should be trained on how to handle injuries, it is required that members of the Safety Committee treat injuries if possible. All injuries must be recorded in both the Injury Log and an Injury Report. Parents/Guardians will be notified immediately of any serious injuries and

9.2 Specifics

Splinters

- Keep area clean; wash hands and affected area, use clean tools.
- Use tweezers to remove.
- Ask for help if needed.

Small Cuts

- If actively bleeding, apply pressure with a clean cloth.
- Remove all foreign objects from cut.
- Clean wound with warm water, pat dry.
- Apply antibiotic ointment, cover with sterile bandage.

Small Burns

- Run cool water over area for several minutes, pat dry.
- Clean the burned area very gently with water.
- Apply a burn gel pack in the first-aid kit.
- Cover with a clean bandage.

Foreign object in eye

- Do not touch, press, or rub eye.
- Find a mentor to help flush eye.

Things dropped on feet/hands

- Remove object.
- Determine if bones are broken (swelling, bruising or tenderness around the area).
- Rest, elevate foot/hand. Apply ice for 15-20 minutes at a time as long as you can.
- Seek medical help if swelling and pain persists after a few days.

Strange material/liquid on hand

- Consult SDS if needed.

10.0 Handling Injuries – Major

10.1 Oversight and Implementation

While it is recommended to have people trained in first aid treat injuries, in case of serious injuries, the nearest member must handle the injury to ensure minimization of the injury.

10.2 Specifics

Large Cuts

If a cut is bleeding severely and blood is spurting out, call 911 immediately.

- Use a sterile bandage or cloth to apply firm and steady direct pressure on the area.
- Inform an adult.

Loss of body parts

- Call 911.
- Elevate injured area, wrapping or covering in a sterile bandage, and apply direct pressure until EMTs arrive.
- Locate missing body part, clean off debris and wrap in a sterile bandage.
- Place in a plastic bag and place plastic bag on ice.

Electrocution

- Separate from current source.
- Call emergency services.
- Perform CPR if necessary.

Large Burns

- Don't touch.
- Call 911.
- Elevate the burn area.
- Monitor the person's breathing and pulse until medical help arrives.

Items stuck in body

- Do not remove
- Call 911

11.0 Emergency Protocols

Emergency Protocols were created and taught to students in order to ensure the team is ready in case of any emergency.

11.1 Fire

In case of a fire in the RR, 911 should be called. All students should leave by exit N and congregate by the handicapped parking spots by the pool entrance to keep clear for emergency services. The fire escape plan is available in all rooms that the team works in, as well as within the safety manual. A copy of the fire emergency plan is available in Appendix A.

11.2 Tornado

In the event of severe weather, all students are to follow the plans on the signs posted for the area they are in, crouch down and face a wall. The RR is a designated severe weather location. The team holds a tornado drill once at least once during build season to ensure students are aware of protocol. A copy of the tornado emergency plan is available in Appendix A.

11.3 Lockdown

911 is called. Mentors should lock doors, turn off lights, hide to make it seem as though nobody is in the room, stay silent. Tech mentor uses the sign in sheet to take attendance.

11.4 Evacuation

In case the building needs to be evacuated, all members must follow the escape routes posted in all rooms and exit the building in a calm and orderly fashion.

12.0 Competition Safety

While safety at competition is similar to that at school, distinct differences exist. It is important to note these distinctions and go through a safety update with all team members prior to competition. All injuries that occur at competition must be reported as well.

12.1 Safety in the Stands

In the stands, students need to be careful and attentive of their surroundings. While having spirit and cheering are important, it is also important to keep calm in the stands. Do not run or jump over bleachers. Keep trash in a bag and straps from any bag should be tucked under it.

12.2 Safety in the Pits

While in the pit, all team members must be attentive and safe. A member of the safety committee must be always in the pit when there are people there. If no one is in the pit, a plastic chain is hung across the front with a laminated sheet attached. A white board marker is used to inform FIRST staff on the location of the team at that moment. All FIRST rules must be observed. If a team member is behaving inappropriately and unsafely in the pit, they will be removed for the day. **No more than 4 student members and 2 mentors are allowed inside the pit at any given time.**

12.3 Safety Materials

The battery spill kit, main first-aid kit, SDS and safety manuals must be kept in the pit in a known and easily accessible location. A secondary safety first-aid kit is available in the stands.

12.4 Venue Policies

The Lead Technical Mentor, Safety Captain and/or Safety Mentor will be responsible for selecting and informing all members and their family and guests the location of the meeting spot in case of an emergency as well as the location of the small first-aid kit.

Students not with their parents are not allowed to leave either the venue or the event and are not allowed to be alone with a mentor that is not their parent/guardian.

12.5 Hotel Policy

In the case that the team stays at a hotel, no boys in girl's rooms and no girls in boy's rooms. All students must be in their rooms at a designated time and may not leave unless it is an emergency. If a hotel has a swimming pool and students wish to use it, a mentor or parent must be at the pool with the students. No student will be alone with a mentor that is not their parent/guardian.

Any disruptive student that does not show gracious professionalism at either the hotel or event venue is at risk of being asked to leave.

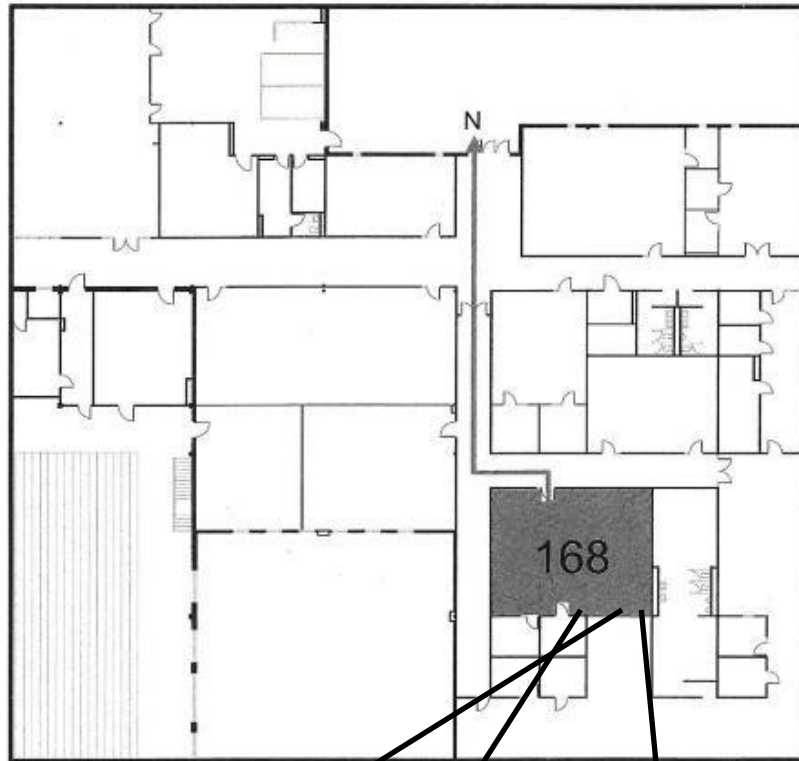
Appendix A: Robotics Room Diagram



168

Legend:

- Primary
- PS Pull Stations
- 🔥 Fire Extinguisher
- 🚑 Defibrillator



Primary Route:
Proceed out of room #168 down corridor and exit out through door N.

Tornado/Severe Weather Location: Room #168

Safety Supply Cabinet (bottom drawers of the large storage cabinet)

Fire Extinguisher

Sink, Eye Wash, Burn Station, First Aid Kit

Fire: Exit through Door N

Severe Weather: Remain in Room 168 (Robotics Room)

Lockdown: Lock doors, turn off lights and remain in Room 168

Appendix B: Battery Spill Kit Instructions

Kit Contents:

Four (4) plastic gallon bags

One (1) pair of powder-free, latex-free, non-sterile gloves

One (1) pair anti-splash, anti-fog goggles

Four (4) boxes baking soda

One (1) small dustpan

Instructions:

1. Remove people from the area and empty out the contents of the battery spill kit.
2. Put on safety goggles and gloves.
3. Open the box of baking soda and apply liberal amounts to the spill.
4. If the acid continues to come out of the battery in any amount, continue to dump baking soda in the immediate vicinity to continue to neutralize the acid.
5. If bubbling stops because all of the baking soda has reacted with the acid, keep adding more baking soda until bubbling stops while baking soda remains.
6. While waiting for bubbling to stop, carefully examine the surrounding area to see if there are any outlying splatter spots that have been reached by the acid. Treat any other places you find.
7. Place the leaking or damaged battery inside a gallon plastic bag.
8. Scrape up the solid materials on the spill site and add them to the bag or to a different bag.
9. Seal the bags and place them in the plastic container.
10. Contact a mentor or adult on site to advise them that there is material that requires disposal.
11. Proceed to a bathroom while wearing PPE. Refrain from touching things and people.
12. Rinse the dustpan and gloves with liberal amounts of freshwater before removing them.
13. Remove and rinse the goggles.

Appendix C: Safety Captain Checklist Location: _____ Date: _____

Teams should review the condition of the inspected area per the criteria in the checklist below. Assess each item and answer the question by placing a "√" in the appropriate column. For any questions answered "no" below, complete a Corrective Action Plan (see next page).

Key: Y = Yes N = No NA = Not applicable

ITEM	Y	N	NA	LOCATION/NOTES
HAND & PORTABLE TOOLS				
Are powered tools in good condition with no evidence of damage?				
Are tools properly stored when not in use?				
Are guards and safety devices in place and operational?				
CHEMICALS				
Are chemical containers properly labeled and in good condition with no sign of damage?				
Are SDSs posted/readily available and team members aware?				
ELECTRICAL				
Are cords and plugs free of broken insulation, exposed wiring, and provided with grounded connections, or double insulated?				
Are electrical outlets overloaded? (1 power strip used per outlet)				
Is the battery charger situated so there is air circulating around it?				
Are the batteries visibly ok, terminals not bent, and no cracks in case?				
TEAM PIT				
Is team equipment within the designated space? Aisle clear?				
Is the area free of slipping and tripping hazards?				
Is storage of materials orderly?				
Does the area conform to the 10' height restriction? This includes banners, signs, and all construction.				

ITEM	Y	N	NA	LOCATION/NOTES
Are the work surfaces neat and uncluttered?				
APPROVED PERSONAL PROTECTIVE EQUIPMENT (PPE)				
Is PPE available for <i>FIRST</i> participants and their visitors?				
Is PPE worn by team members where required/posted?				
Is PPE properly maintained and stored?				
RESPECT OF STORED ENERGY DANGERS				
After competing: Does the team relieve electrical, pneumatic, and miscellaneous energy before moving the robot off the field?				
In the pit: Does the team ensure no one is working on the robot while it is energized?				

Appendix D: Injury Log

NAME _____ DATE _____

Name of Safety Committee Member: _____

INJURY _____

ACTION TAKEN _____

NAME _____ DATE _____

Name of Safety Committee Member: _____

INJURY _____

ACTION TAKEN _____

NAME _____ DATE _____

Name of Safety Committee Member: _____

INJURY _____

ACTION TAKEN _____

Appendix E: Serious Injury Report

Name _____ Gr. _____ Date _____

Injury _____

Detailed description of how the injury occurred

Detailed description of how the injury was treated

Student Signature _____

Safety Captain Signature _____

Adult/Mentor Signature _____

Sent to Castle High School Nursing Office: Date: _____ Time: _____

I have read and understood the type of injury and treatment given.

Parent Signature _____ Date _____

Student Signature _____ Date _____

Castle Robotics Club

Safety Contract

I, _____, have read and will abide by the policies and procedures in the CRC Safety Manual and the FIRST Safety Manual to the best of my ability, and will help others do the same.

- I will use safety glasses and any other necessary safety equipment at all times in work areas during builds.
- I will wear appropriate clothing to use equipment.
- I will use caution and common sense while working.
- I will be responsible for proper care and maintenance of tools and equipment, and only use tools for their intended purpose.
- I will always clean up after using any tools, and clear walking areas from obstructions.
- I will look out for the safety of others and always encourage safe conduct.
- I will report any injuries to the team leaders or mentors.

Student Name (printed): _____

Student Signature: _____ Date: _____

Parent/Guardian Name (printed): _____

Parent/Guardian Signature: _____ Date: _____

Parent/Guardian Phone Number: _____

Secondary Emergency Name and Relationship: _____

Secondary Emergency Phone Number: _____