



# Creating a Culture of Safety in Your Lab, Your Teaching, and Your Department

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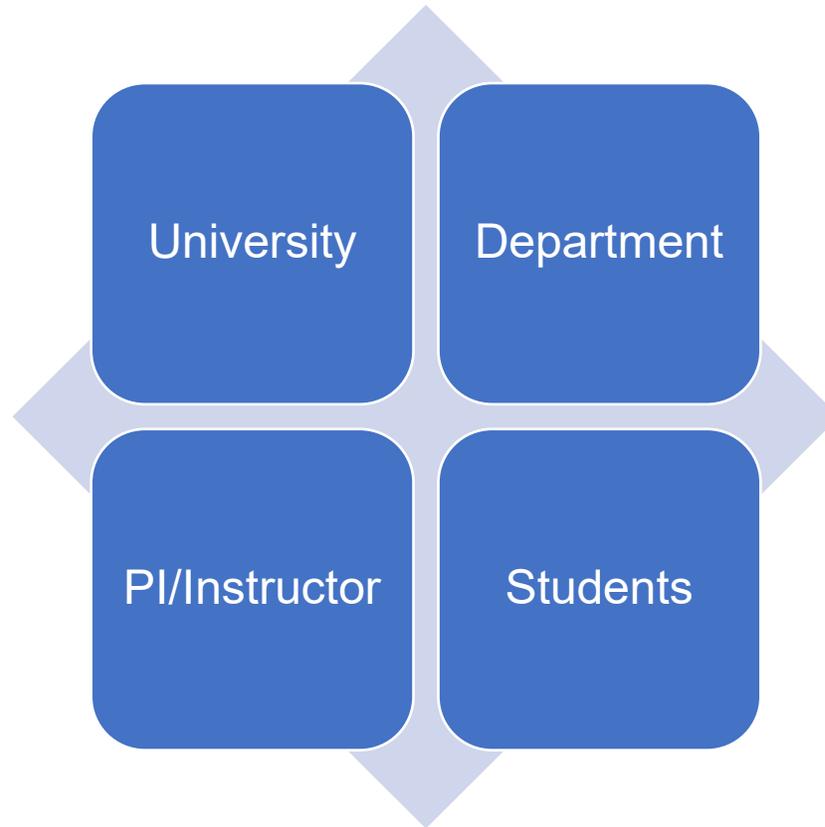
Think, Pair, Share:  
What are key components of  
laboratory safety?

# Aspects of Safety Culture

- Identifying loci of authority
- Empowering practitioners
- Obtaining, transmitting, and employing accurate, actionable safety information

# Identifying Loci of Authority

*Who is responsible for laboratory safety?*

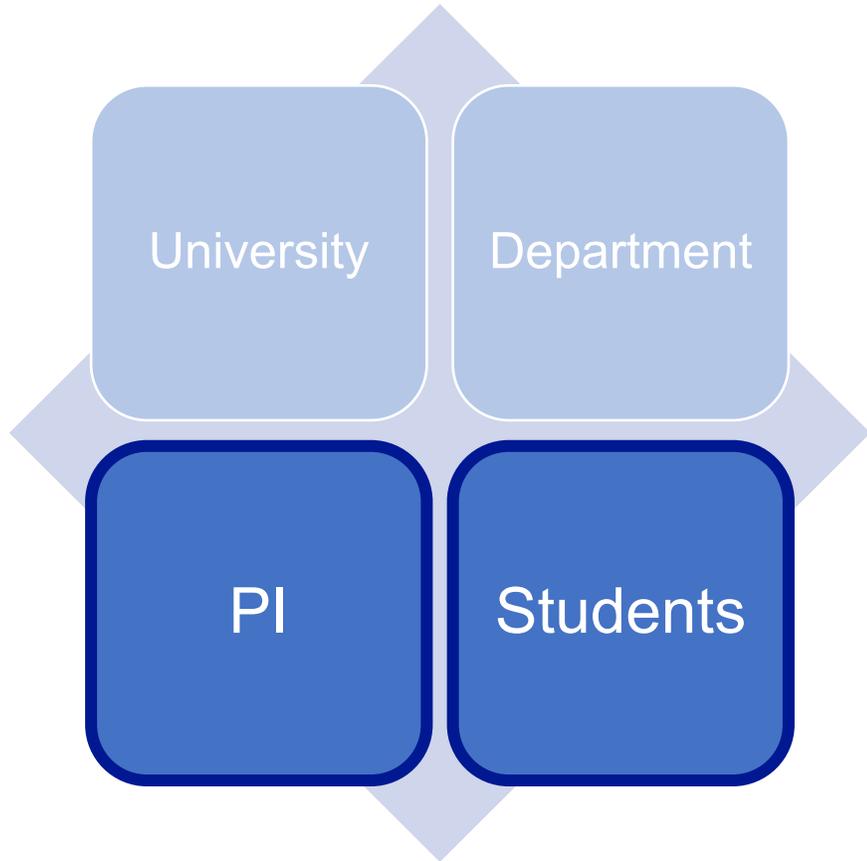




# Safety in a Research Lab

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# Group Safety Practices and Culture



- Identifying loci of authority
- Empowering practitioners
- Obtaining, transmitting, and employing accurate, actionable safety information

# How Do We Empower Ourselves and Students?

- Create a culture that welcomes feedback and questions
- Prioritize safety information in our group activities such as group meeting
- Prioritize safety in our group practices such as lab introductions, experiment protocols, and laboratory documentation (e.g. handbooks)

# Creating a Welcoming Safety Culture: Tip #1

Dedicate time in each group meeting to safety topics.

- 1-2 slides or a detailed account of a particular topic.
- Round table discussion of events from the lab that week.
- Group workshopping of safety hazards for an upcoming experiment.

# Creating a Welcoming Safety Culture: Tip #3

Address ways that personal, power, and individual dynamics influence lab safety

Think, Pair, Share:

What are instances where power dynamics may positively or negatively influence lab safety culture?

# Creating a Welcoming Safety Culture: Tip #3

## Familiarize yourself with themes of unsafe behaviors

- Honestly unaware that the behavior is unsafe.
- Knows that the behavior is unsafe but does not know other options.
- Knows that the behavior is unsafe but too lazy to correct.
- Cavalier attitude.
- Deliberately seeking risk.

# Creating a Welcoming Safety Culture: Tip #4

## Create positive relationships with Safety Officers, EHS

- Make safety officer a *thankful* job.
- Give verbal praise in a group meeting.
- Encourage and treat EHS as friends and helpers.
- Seek EHS advice
- Take inspections and feedback seriously; engage students in preparation and participation

Other ideas for welcoming  
safety?

# Who Might Influence Safety Culture in Your Lab?

- Other groups
- Friends
- Online resources
- Social media
- Teaching labs



# Safety in the Teaching Lab

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Amy Blondin Hotchkiss  
and Hannah Stern

# Safety teams

In the Laboratory

## Safety Teams: An Approach To Engage Students in Laboratory Safety

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Our increasing understanding of chemical hazards and risk management is accompanied by the rise of a new culture of concern for laboratory safety. An important duty of chemical educators is to establish and maintain a safe laboratory environment as well as to foster among students “good attitudes toward rational risk assessment and safe habits” through continual education (1). This task is important not only from a safety standpoint, but also to prepare our students for future work in college, in professional school, and in the workplace. Effective safety education can also minimize instructor liability in the event of an accident (2, 3). Unfortunately, many universities could better incorporate chemical safety education into their curricula (4, 5)

demonstrate, and assess safe laboratory practices. With these goals in mind, we created an active, collaborative safety program involving student “safety teams” that builds students’ skills and safety consciousness through student-led safety presentations, laboratory monitoring, and postlab inspections for each weekly lab session. Although we implemented this program in organic chemistry, one asset of the safety teams approach is that it could be appropriately modified and implemented in nearly any science laboratory course. This article describes safety teams in detail and provides preliminary assessment of the program’s effectiveness.

### Incorporating Safety Teams

J Chem Ed 87(8) August 2010 p 856 DOI: 10.1021/ed100207d

Student teams responsible for safety during the lab period  
Safety presentation, spot checks, post-lab inspection





# “Safety is our Superpower!”



- Assign teams with individuals from two different sets of lab partners
- Teams prepare safety sheet
  - Physical and chemical hazards, PPE, waste per experiment
  - Sent 2 days in advance to TAs for review
  - Handouts at each lab (no presentations)
  - Used to guide safety section of lab reports
- Team monitors during lab, stays until end of lab, “audits” PPE, shower/eyewash test dates, and first-aid kit



# Creating a welcoming safety culture: Tip #5



## Discuss safety at every TA meeting

- TAs discuss how to “confront” safety problems professionally and convey that TAs/lab staff have ultimate responsibility
  - “In this lab, we wear PPE.”



# Creating a welcoming safety culture: Tip #5

## Discuss safety at every TA meeting

- TAs discuss how to “confront” safety problems professionally and convey that TAs/lab staff have ultimate responsibility
  - “In this lab, we wear PPE.”
- During TA meetings, have TAs predict mistakes or sources of concern from students while performing a lab.
- Create scenarios of situations that could happen in the teaching lab for TAs to discuss interventions, proper protocol, what to do and who to contact.
- Practice is the best training.

# Example of Scenarios

- You are in the lab teaching when a student mentions that they do not feel well and the next second the student is on the floor.
- What would you do?
- Discuss with your group
- Noel walks into the lab 25 minutes late through an open door in the organic lab. He goes to his work station and starts the experiment without communicating with you.
- What should you do?
- Discuss

# CHEM 5501: Chemical Safety in the Research Laboratory

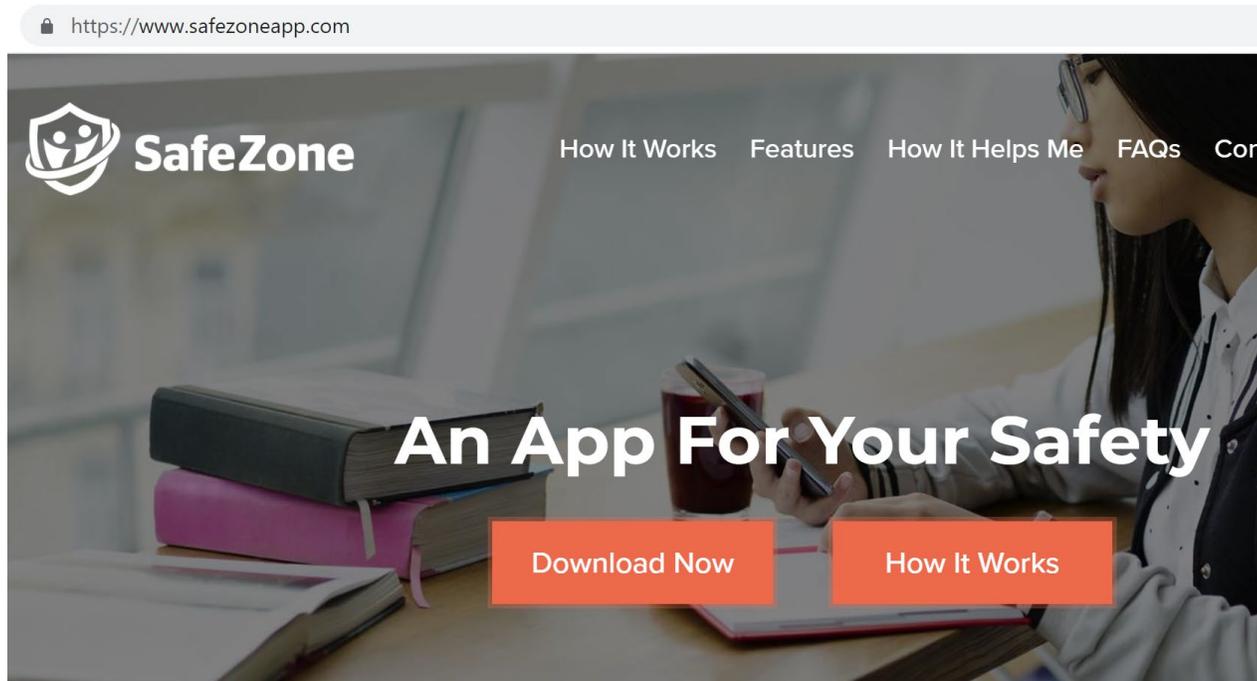
Learning Outcomes A student finishing this course is expected to accomplish the following:

- 1) Learn what to do/who to contact when an emergency happens in the research laboratory.
- 2) Gain the understanding of how to conduct research with chemicals in the laboratory.
- 3) Master the techniques of the safe practice of laboratory procedures associated with their specific research project.
- 4) Gain an appreciation as to how to design a new research experiment that is safe.
- 5) Gain a perspective as to how a focus on safety can make one a more productive researcher.

Year-long 3x1-credit courses, sustained focus on safety

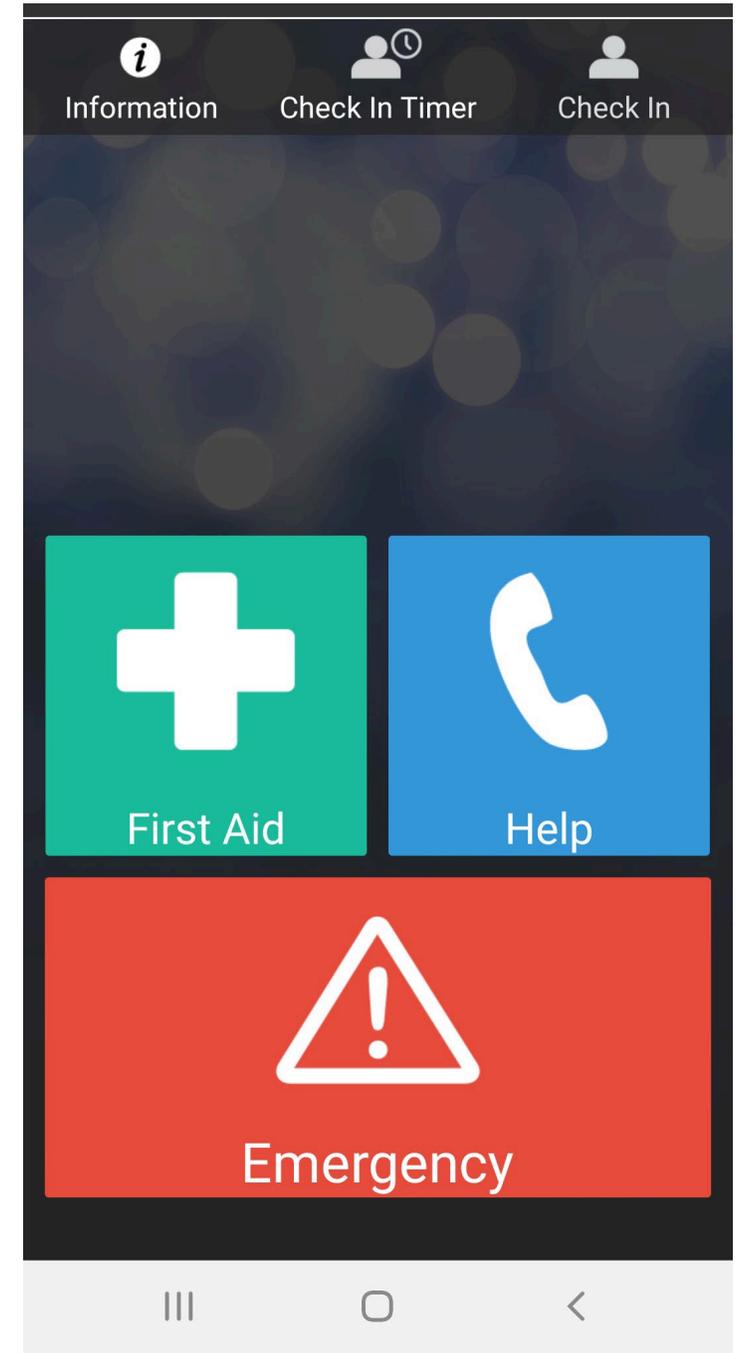
Case studies, worst case planning, SOPs for chemicals and equipment, formal safety training

# SafeZone App



## **\*\*Institutional subscription\*\***

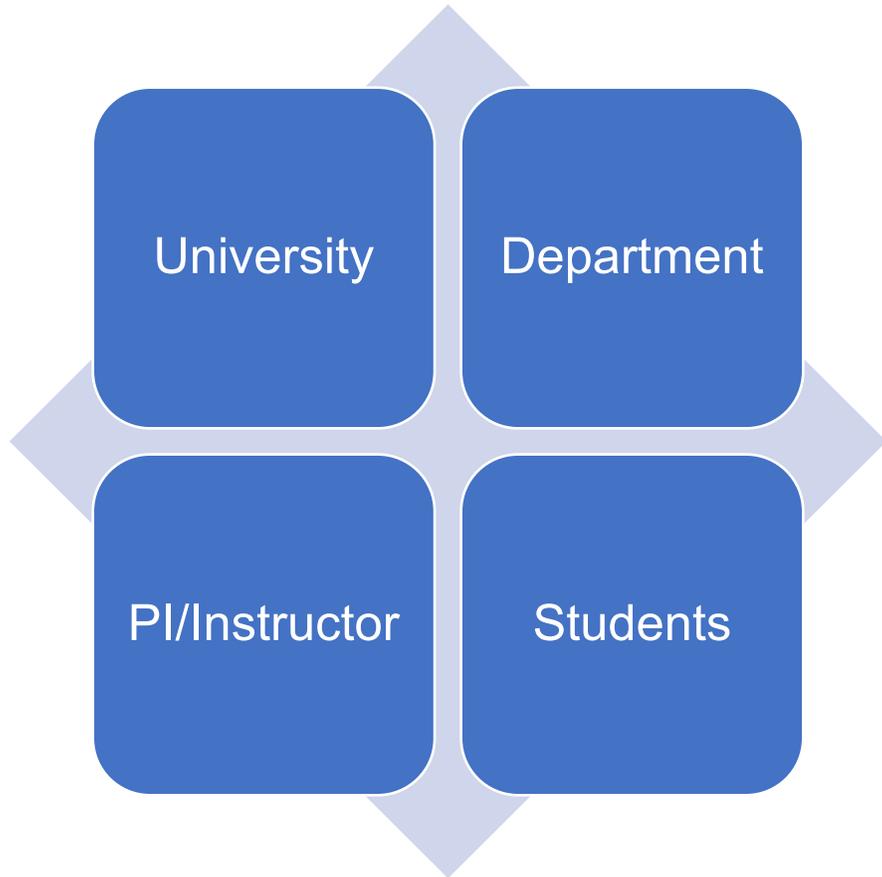
Check-in timer for people working alone  
Check in to campus (COVID)  
Call for help





Safety Culture Everywhere

# Engaging Everyone, Helps Everyone



- Safety discussion in faculty meetings
- Prioritized in curriculum development
- Investment in EHS resources and outreach
- PI training and tool development
- Student empowerment and training
- Dissemination of successes AND failures

