2ND PROFESSIONAL YEAR (VETERINARY MICROBIOLOGY)

TOPIC: ORIENTATION TO BACTERIOLOGY LABORATORY

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Let's Get Started!

Working in a laboratory can be an exciting experience.

- It can also pose many threats and hazards that a traditional classroom does not.
- That is why it is important to know your surroundings.
- Know where the exits to your room are.
- There may be more than one exit which could be critical in the case of an emergency.
- Your supervisor will go over the emergency action plan including the escape route procedures for your room.

Many laboratories contain hazardous substances.

- A ***hazardous substance*** is defined as a material/substance that poses a physical or health hazard. This includes both chemicals and biological agents.

- A ***Biohazard*** is defined as any organism that is capable of replication and is capable of causing disease in human, animal or plant.

- There are differences between a physical hazard and a health hazard. Let's take a look.

Laboratory health hazard

A health hazard has the following characteristics:

- ✓Carcinogen
- ✓Toxic or highly toxic
- ✓Reproductive Toxins
- ✓Irritants
- ✓Corrosives
- ✓Sensitizers
- ✓Hepatotoxins
- ✓Nephrotoxins
- ✓Neurotoxins

Laboratory health hazard

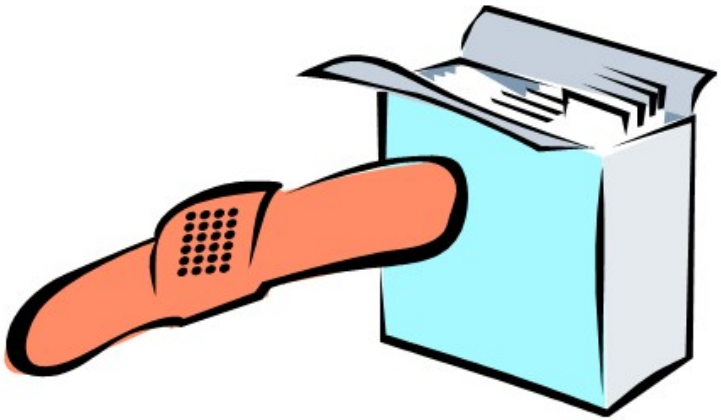
A physical hazard has the following characteristics:

- ✓Explosive
- ✓Flammable
- ✓Oxidizer
- ✓Pyrophoric
- ✓Organic peroxide
- ✓Compressed gas
- ✓Combustible liquid
- ✓Unstable (Reactive)
- ✓Water-reactive

Laboratory health hazard

- When physical hazards and health hazards exist, it is very important to know where the eye wash/safety shower is located.
- Unexpected accidents do occur and knowing where to go at the time of an emergency can reduce injury/illness.

Know Your Surroundings



First aid kits have a variety of quick relief items. If your lab has a first aid kit, find out where it is. If more than first aid is needed, it is recommended to go to Student Health Services for further treatment. In an event that would require more than first aid to be treated, report it to the EHS office within the next 24 hours.

Know Your Surroundings

- When there are chemical, biological, or radioactive agents being used, an emergency spill kit should be available.
- If there is a spill kit in your lab, find its location. Further Spill information will be addressed later in this presentation.

Know What Hazards are Present

Lab Safety: Everyone Is Responsible!

Safety In the Microbiology Laboratory

Rules and Symbols

Safety First

- Science is a hands-on laboratory class.
- You will be doing many laboratory activities, which require the use of hazardous chemicals and expensive lab equipment.
- Safety in the science classroom is the #1 priority.
- To ensure a safe science classroom, a list of rules has been developed and provided to you in your student safety contract.
- These rules must be followed at all times.
- A signed lab safety contract is required to participate in labs.

General Safety Rules

- Be Responsible at All Times. No horseplay, practical jokes, pranks, etc.
- Follow all instructions carefully.
- Do not play with lab equipment until instructed to do so.
- Food, drink, and gum are not allowed in the science classroom.

Lab Safety: Everyone Is Responsible!

General Safety Rules

- Keep the science room clean and organized.
- Notify the teacher immediately of any accidents or unsafe conditions in the science classroom!
- Wash your hands with soap and water after experiments.

Lab Safety: Everyone Is Responsible!

Safety Symbols

Eye Protection

- Wear safety goggles when working with chemicals, flames, or heating devices.
- If a chemical gets in your eye, flush in water for 15 minutes and notify the teacher.

Sharp Objects

- When using knifes or other sharp objects always walk with the points facing down.
- Cut away from fingers and body.

Electrical Safety

- Do not place a cord where someone can trip over it.
- Never use electricity around water.
- Unplug all equipment before leaving the room.

Safety Symbols

Animal Safety

- Only handle living organisms with teacher permission.
- Always treat living organisms humanely.
- Wash your hands after handling animals.

Heating Safety

- Tie back hair and loose clothes when working with open flames.
- Never look into a container as you are heating it.
- Heated metal and glass looks cool, use tongs or gloves before handling.
- Never leave a heat source unattended.

Safety Symbols

Chemical Safety

- Read all labels twice before removing a chemical from the container.
- Never touch, taste, or smell a chemical unless instructed by the teacher.
- Transfer chemicals carefully!

Hand Safety

- If a chemical spills on your skin, notify the teacher and rinse with water for 15 minutes.
- Carry glassware carefully.

Plant Safety

- Do not eat any plants in lab.
- Wash your hands after handling plants.

Any Questions?

- REMEMBER:
- Carefully read through the entire safety contract and sign.
- Have your parents read and sign your safety contract.
- Study for the safety quiz later this week!

Laboratory Attire

Remember the following:

- ✓No open-toed shoes
- ✓No shorts unless a lab coat is used
- ✓Restrain hair when working with hazardous materials
- ✓Remove protective clothing in public
- ✓Use the proper Personal Protective Equipment for the job

Personal Habits

Personal habits play a large role in minimizing hazards. The following measures must be taken:

- ✓Do not eat, drink, smoke, chew gum or apply cosmetics, or remove/insert contact lenses while in the laboratory
- ✓Do not store food or beverages in the lab or in chemical refrigerator
- ✓Do not mouth pipette
- ✓Wash hands before leaving laboratory or after handling contaminated material

Safe Practices

These safe practices should be followed to ensure safe working conditions:

- ✓ Do not use chipped or cracked glassware
- ✓ When working with hazardous materials, have a second person nearby
- ✓ Know emergency procedures
- ✓ Keep the laboratory neat and clean
- ✓ Use hazardous chemicals under a fume hood and biohazardous materials under a biosafety cabinet (BSC)
- ✓ Decontaminate as needed
- ✓ All procedures should be performed to minimize aerosol

Labeling

It is important to know as much about a chemical as possible.

- The most dangerous substance is the one that has no label.
- Communicating information is essential in the science field.

You Should Never…

- Enter store room unless given permission
- Take any chemicals from lab or store room
- Touch any equipment, chemicals, or other materials until instructed to do so

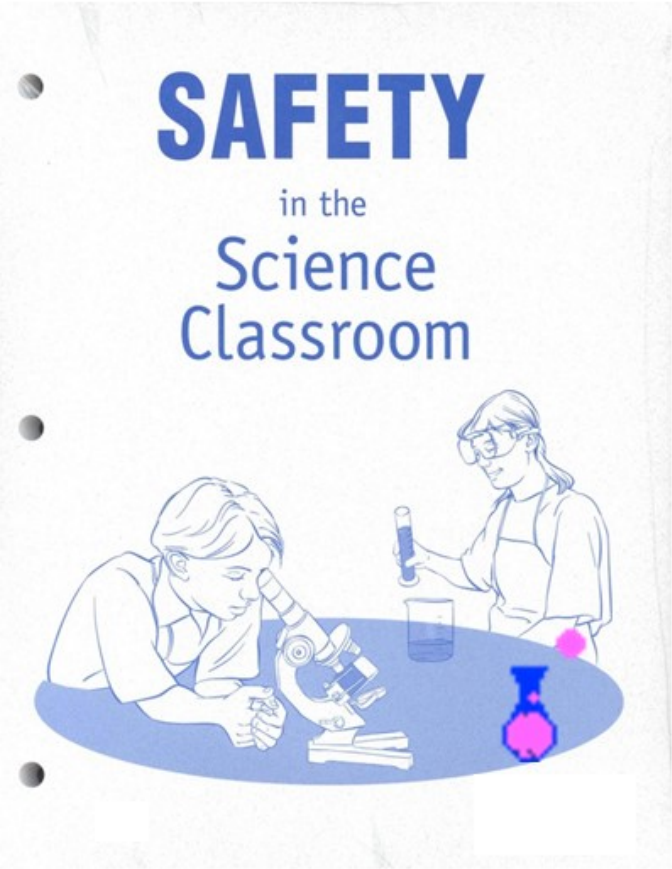
You Should Never…

- Eat or drink in the lab
- Use lab glass-ware to eat or drink out

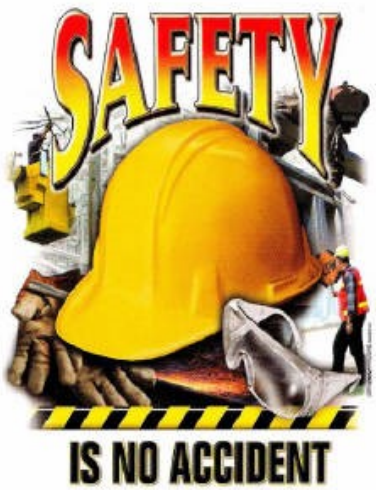
You Should Never…

- **Engage in….**
  - practical jokes
  - horse play
  - rough house

The favourite practical joke amongst Big Bang theorists.



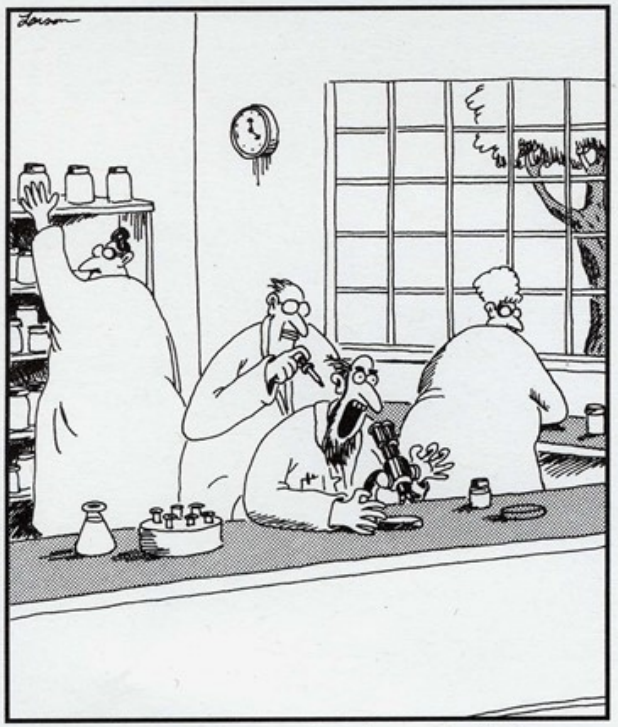
Safety and Rules of the Lab



Safety Symbols

- Know safety symbols
- They appear in your laboratory activities
- They will alert you to possible dangers
- They will remind you to work carefully

Be alert and cautious

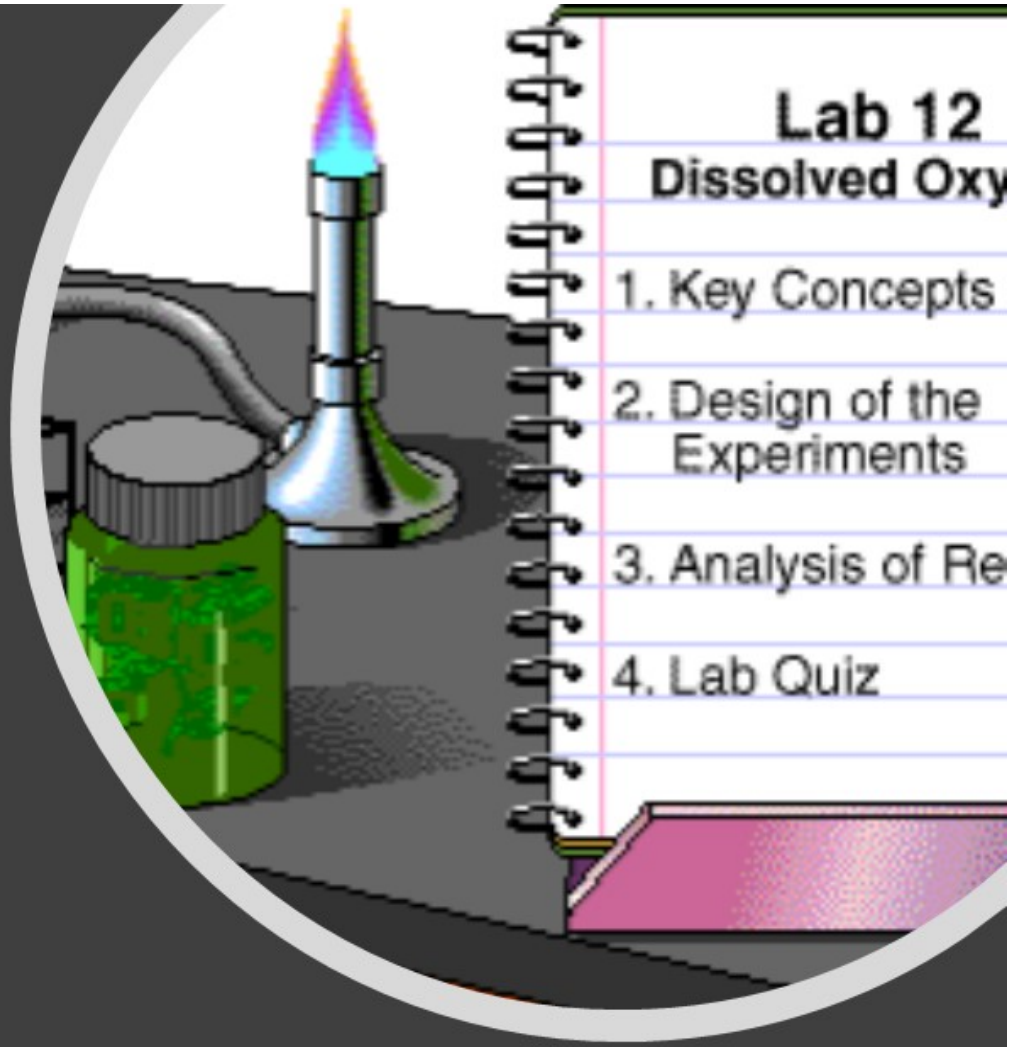


Professor Glickman, the lab practical joker, deftly places a single drop of hydrochloric acid on the back of Professor Bingham's neck.

- Exercise Caution and Good Judgment
- Follow all instructions given by the teacher
- Notify the teacher immediately regarding any accident or unsafe areas

Self constraints

- Read lab instructions ahead of time
- Always follow lab procedures exactly
- Never do an unauthorized experiment



Protect Yourself
Eye Safety

- Wear safety goggles when working with chemicals, flames, or heating devices
- or if possibility of flying debris

- If you wear contact lenses let your teacher know

Protect Yourself
Eye Safety

- Flush in water for 15 mins. and notify the teacher

- In case of emergency in which a chemical goes into one's eye, use the eyewash station

Protect Yourself
Proper Attire

- Keep all long hair tied back
- Do not wear loose clothing that could catch on fire

- Foot wear that completely covers the foot is required

Protect Yourself
Hand Safety

- If a chemical spills on your skin, notify the teacher and rinse with water for 15 minutes
- Wash hands after every lab

- Handle glassware, sharp tools and heated containers carefully

"They hate it when you carry the testtubes that way."

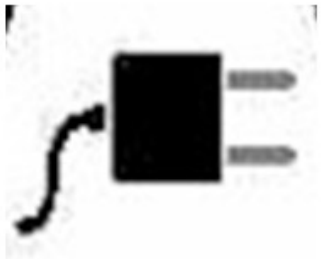
Protect Yourself
Hand Safety

Sharp Objects

- Always cut away from fingers and body
- Always carry sharp objects with points and tips facing down and away
- Never try to catch falling sharp instruments
- Grasp sharp instruments only by the handles

Sharp Objects

- Notify teacher if you get cut
- Broken glass and sharp objects do not go in trash cans
- Teacher will clean up broken glass



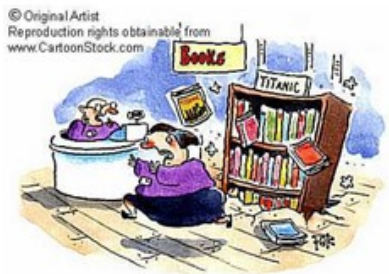
Electrical Safety

- Only electrical plugs are to be placed into an electrical outlet
- Unplug electrical equipment after use
- Keep all electrical cords, wires, and appliances away from water

Physical Safety

- Handle all equipment carefully
- Do not place a cord where someone can trip over it
- Push all stools in out of the way

UH,UH,UH,YOU WEREN'T LIFTING WITH YOUR LEGS WERE YOU?!

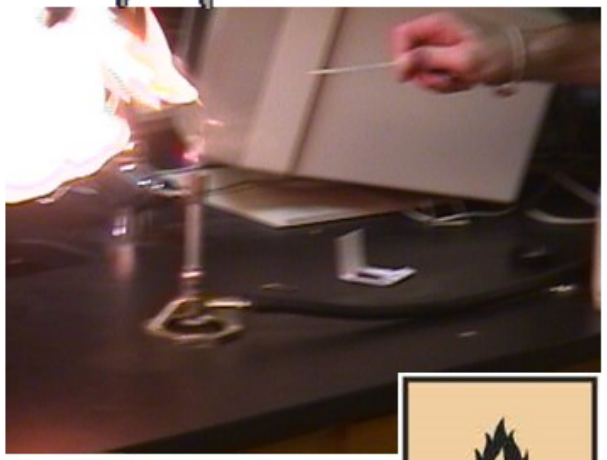


"She's going down!"

- Keep books picked up out of walking isles

Heating Safety

- Tie back hair and loose clothes when working with open flames
- Never look into a container as you are heating it
- Never point the end of a test tube being heated at yourself or others



- Never heat in a closed container

Heating Safety

- Never leave a heat source unattended
- Heated metal and glass looks cool, use tongs or gloves before handling
- Do not place hot glassware directly on lab desk or in cold water

Chemical Safety

- Read all labels twice before removing a chemical from the container

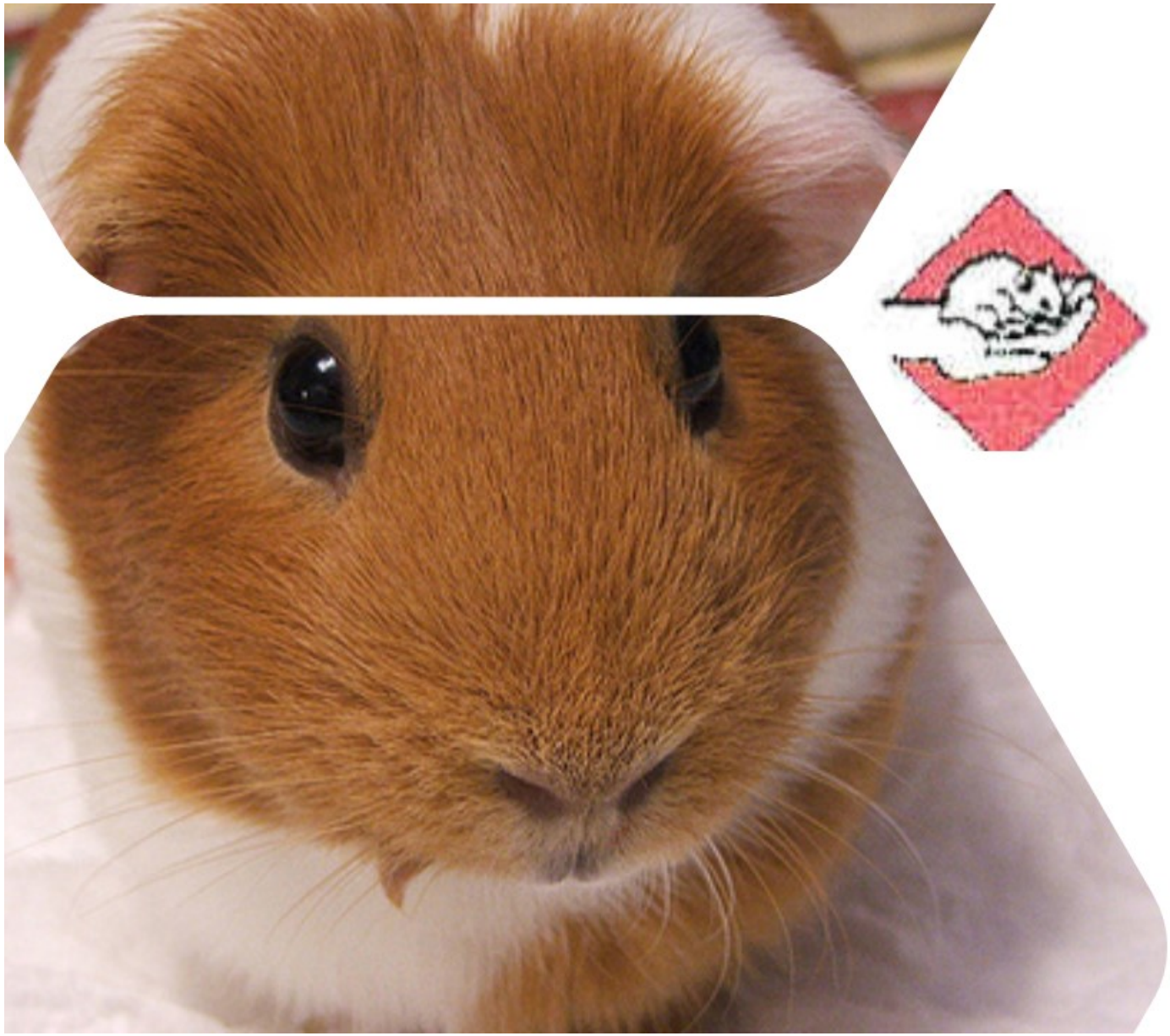
- Only use the type and amount of chemical instructed to use
- Never touch, taste, or smell a chemical unless instructed by the teacher
- Never mix chemicals unless instructed to do so

Chemical Safety

- Transfer chemicals carefully!
- Keep lids on chemical containers when not in use
- When diluting an acid, pour the acid into water
- Consider **all** chemicals dangerous

Corrosive

Radioactive Biohazard Poison Oxidizing Explosive Flammable

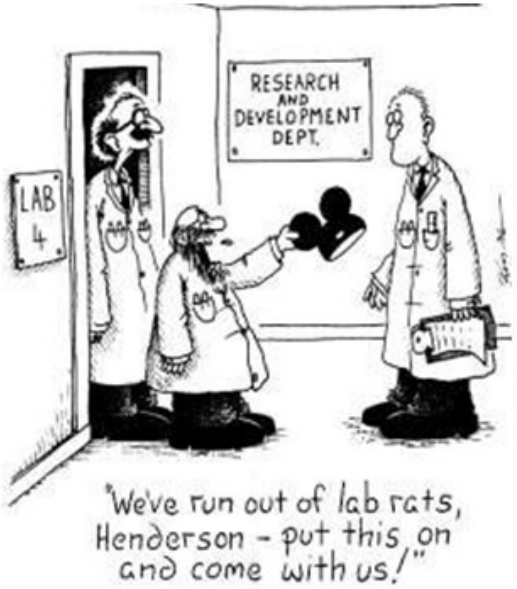


Animal Safety

- Only handle living organisms with teacher permission
- Always treat living organisms humanely
- Wash your hands after handling animals

Treatment of Specimen

- Respect the life of all laboratory specimen



- your education

You Should Never…

- Enter store room unless given permission
- Take any chemicals from lab or store room
- Touch any equipment, chemicals, or other materials until instructed to do so

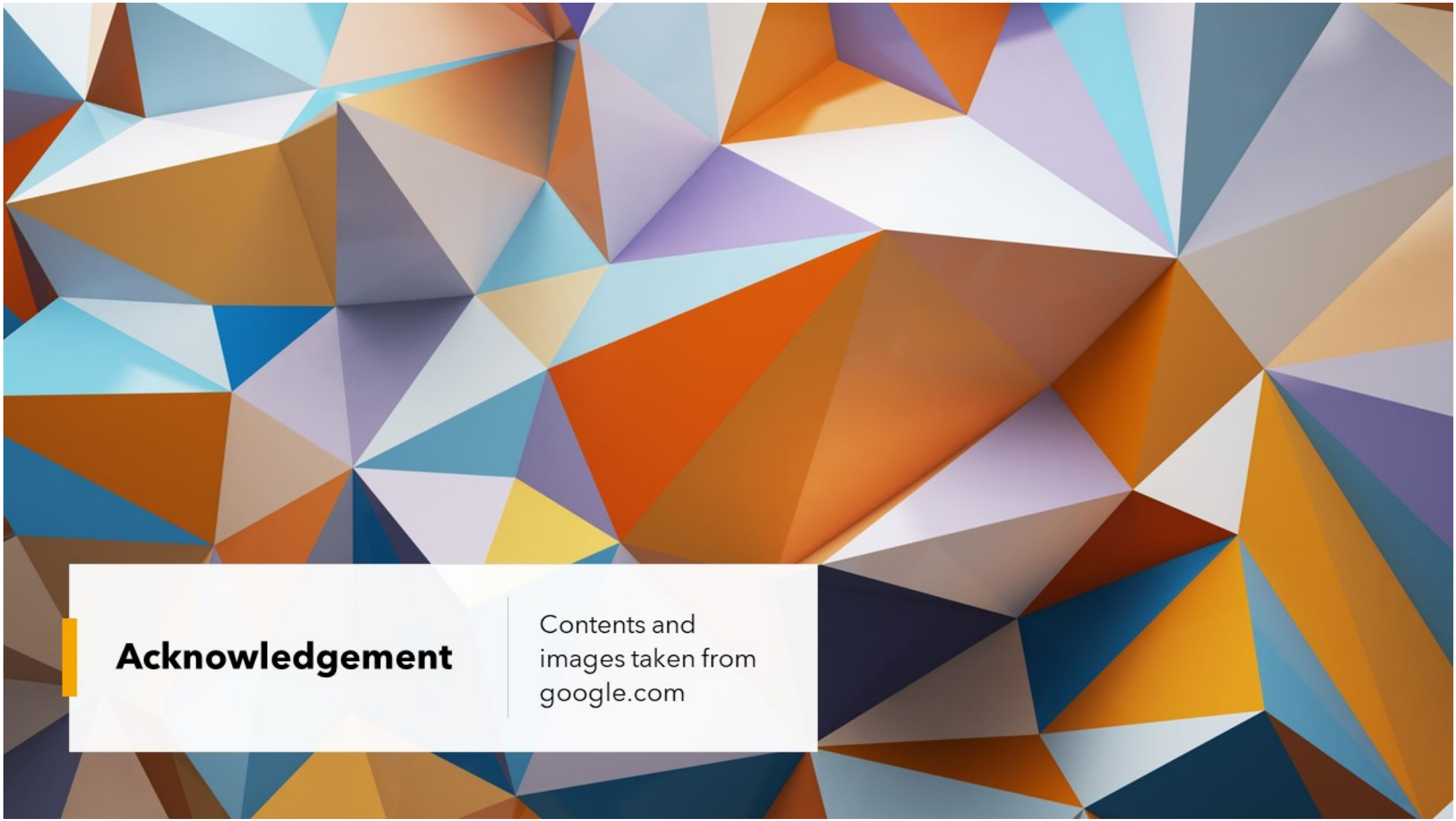
In case of an emergency…

- Know the locations of:
  - fire extinguisher
  - fire blanket
  - body shower
  - eyewash station
  - first aid kit

- If you spill a harmful chemical on yourself or in your eyes, start rinsing immediately and send your partner to get teacher's help

Remember to…

- Stay at your work station
- Maintain a clean work area
- Read and follow all directions
- Report any spills, accidents, or injury to the teacher immediately
- Clean and put away all equipment at the end of the lab period
- Dispose of waste products according to instruction



Acknowledgement

Contents and images taken from google.com

Any questions????????

THANK YOU