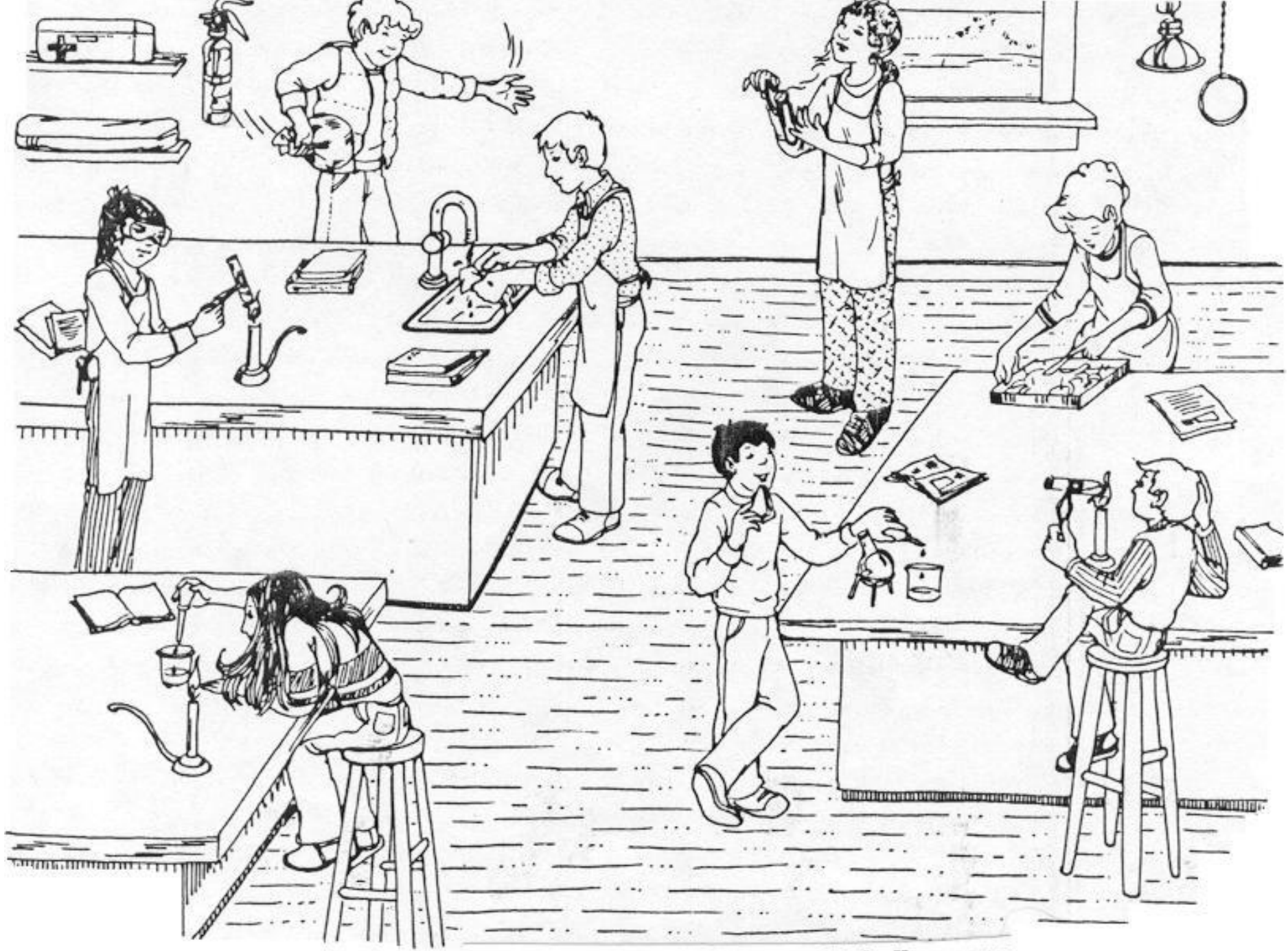
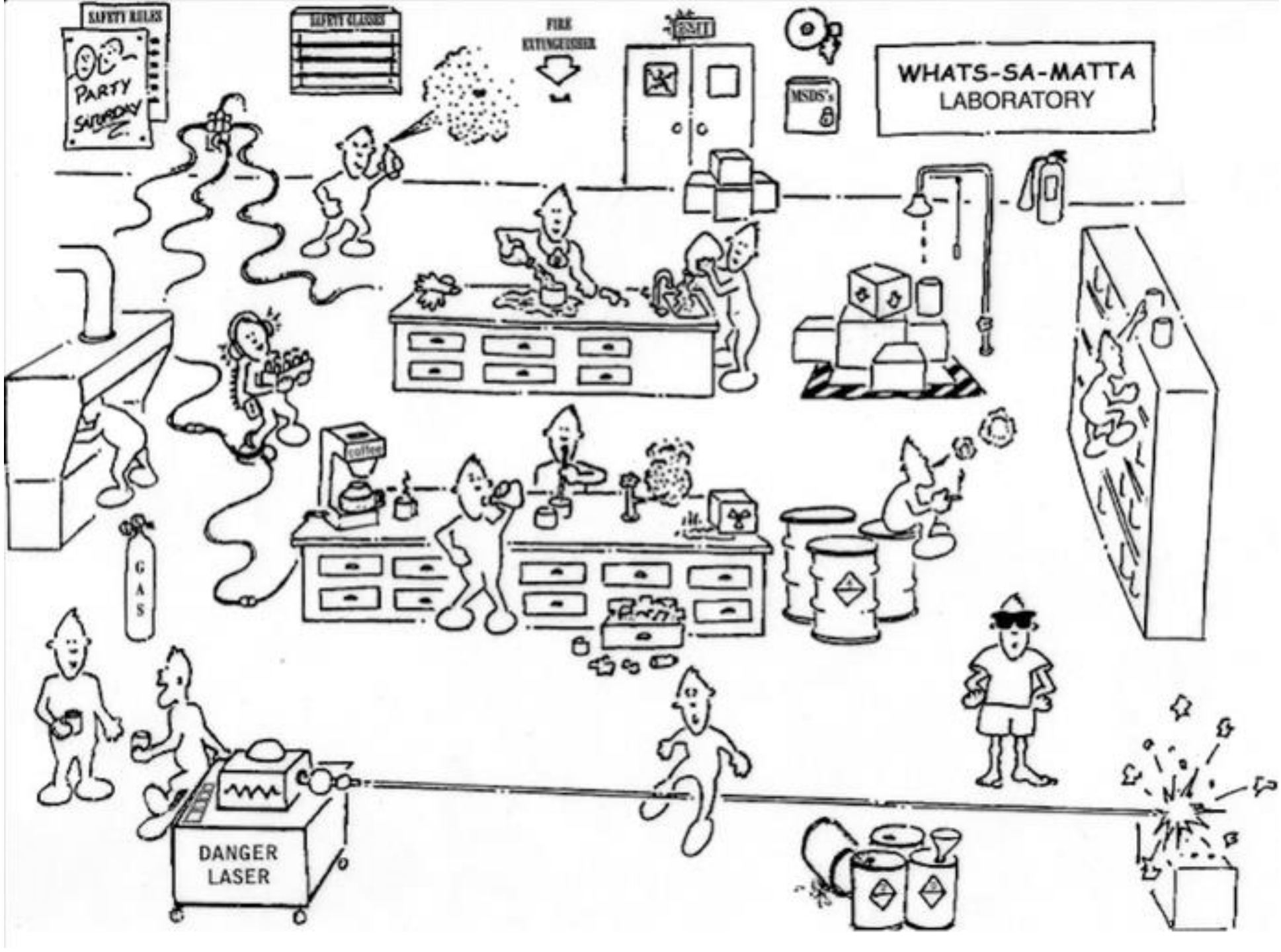
LAB SAFETY

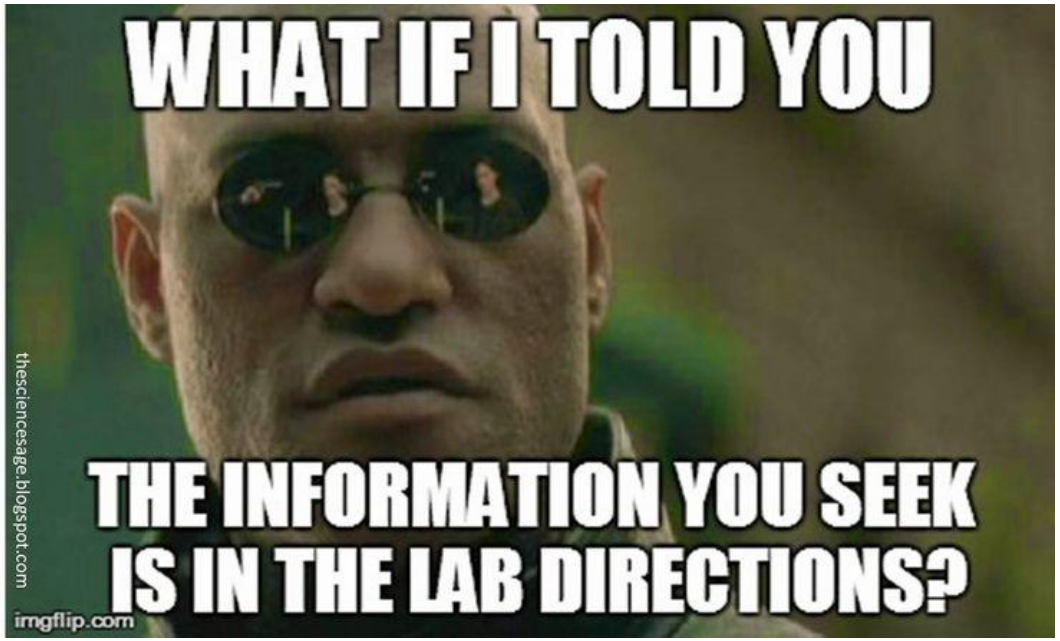


Created or selected by Chris Heumann


SAFETY RULES
PARTY
SATURDAY
FIRE EXTINGUISHER
EXIT
MSDS's
WHATS-SA-MATTA
LABORATORY
coffee
GAS
DANGER
LASER

BEFORE BEGINNING THE LAB:

- **Read** the lab instructions and know what you are doing in the lab
- **Wear clothing that will not cause unsafe conditions** (no open-toe footwear, jewelry, or loose clothing)
- For long hair, bring something to tie your hair back
  - This avoids having hair fall into chemicals or catch fire
- **Know where the lab safety equipment and emergency exit are located**
  - Fire blanket, fire alarm, fire extinguisher, eye wash stations, emergency shower (if present), fume hood (if present)
  - Know where the emergency exits are



BEFORE BEGINNING THE LAB:

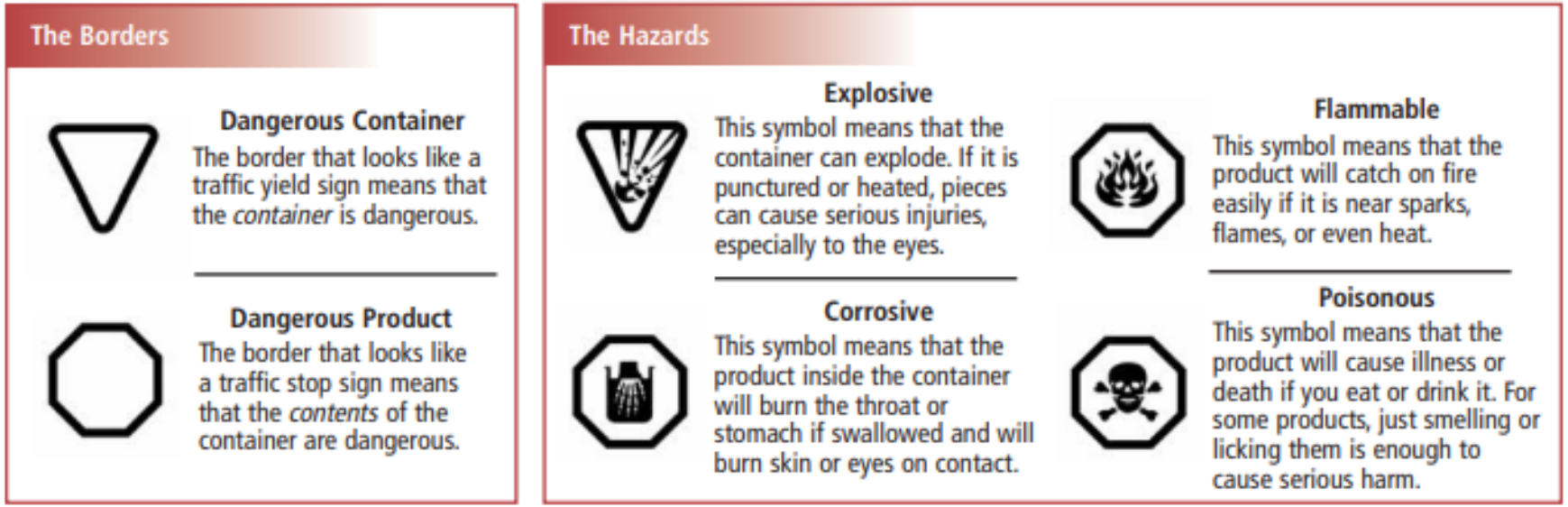
- Know WHMIS – Workplace Hazardous Materials Information System
  - WHMIS is a system to identify chemicals in the workplace. It uses symbols to identify the chemicals easily. Only dangerous products will have a symbol.
  - Material Safety Data Sheets (MSDS) provide all chemical details

	**Exploding bomb** (for explosion or reactivity hazards)		**Flame** (for fire hazards)		**Flame over circle** (for oxidizing hazards)
	**Gas cylinder** (for gases under pressure)		**Corrosion** (for corrosive damage to metals, as well as skin, eyes)		**Skull and Crossbones** (can cause death or toxicity with short exposure to small amounts)
	**Health hazard** (may cause or suspected of causing serious health effects)		**Exclamation mark** (may cause less serious health effects or damage the ozone layer*)		**Environment*** (may cause damage to the aquatic environment)
	**Biohazardous Infectious Materials** (for organisms or toxins that can cause diseases in people or animals)				

Note: Oxidizing materials just produce oxygen (or something similar) that can be used to cause fires (fires need oxygen, fuel, heat, and a chemical reaction)

BEFORE BEGINNING THE LAB:

- Other hazard symbols are used for common household products with safety hazards. Each hazard symbol provides two kinds of warnings:
  - whether the hazard is the container or its contents, shown by the shape of the border
  - the type of hazard—explosive, corrosive, flammable, or poisonous—shown by an image at the center of the symbol

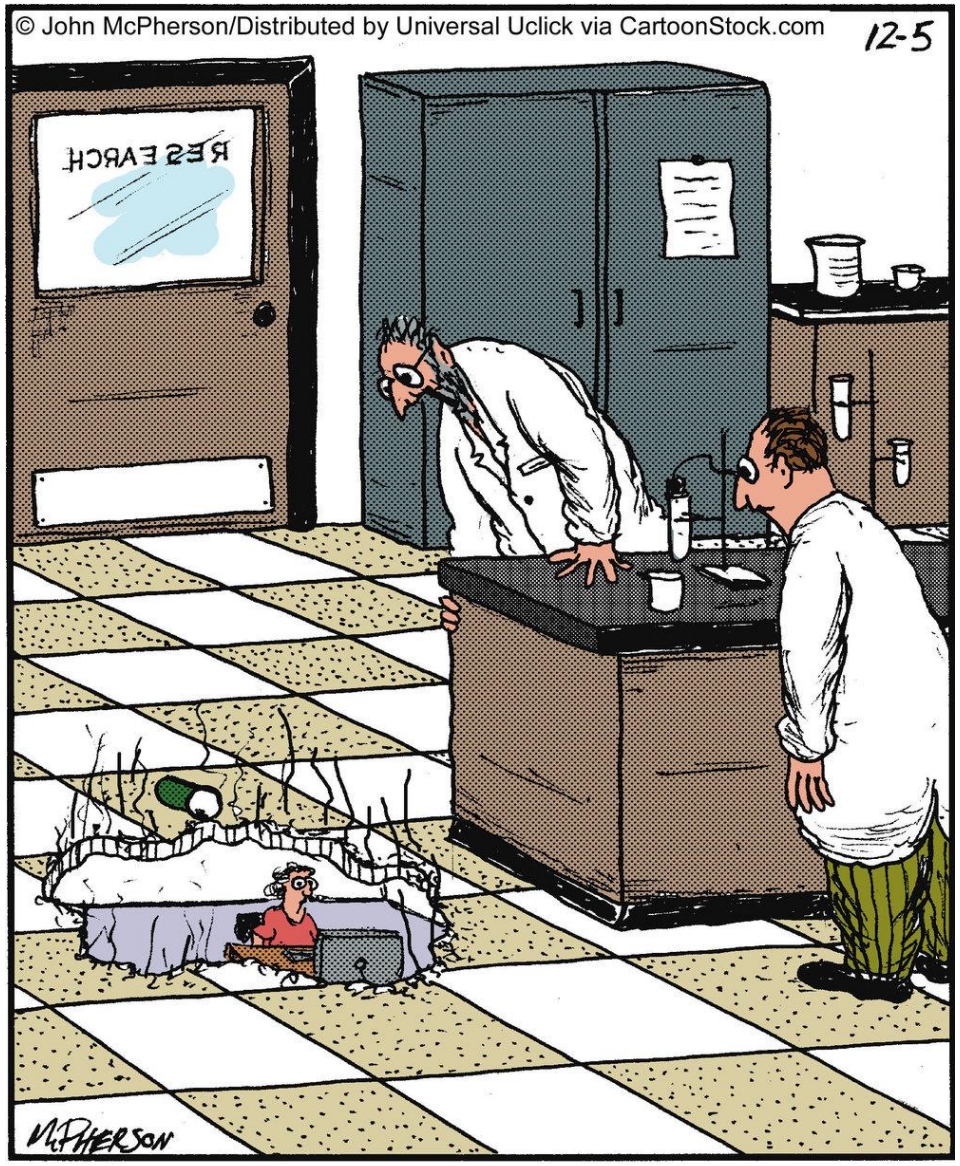


BEFORE BEGINNING THE LAB:

- Clear the table
  - **Bags need to be under the table** to avoid tripping
  - Only lab procedure sheet, the data recording sheet, and something to write with.
- **Wash** your hands
  - **Wash** glassware before use
- Wear appropriate **PPE** (Personal Protective Equipment)
  - Goggles, lab coat/apron, gloves, masks, appropriate footwear (no skin exposed)
- **Inspect** all **lab equipment** before use.
  - Look for chipped glass, frayed wires, damaged sections of the equipment, and other problems like flickering lights

DURING THE LAB:

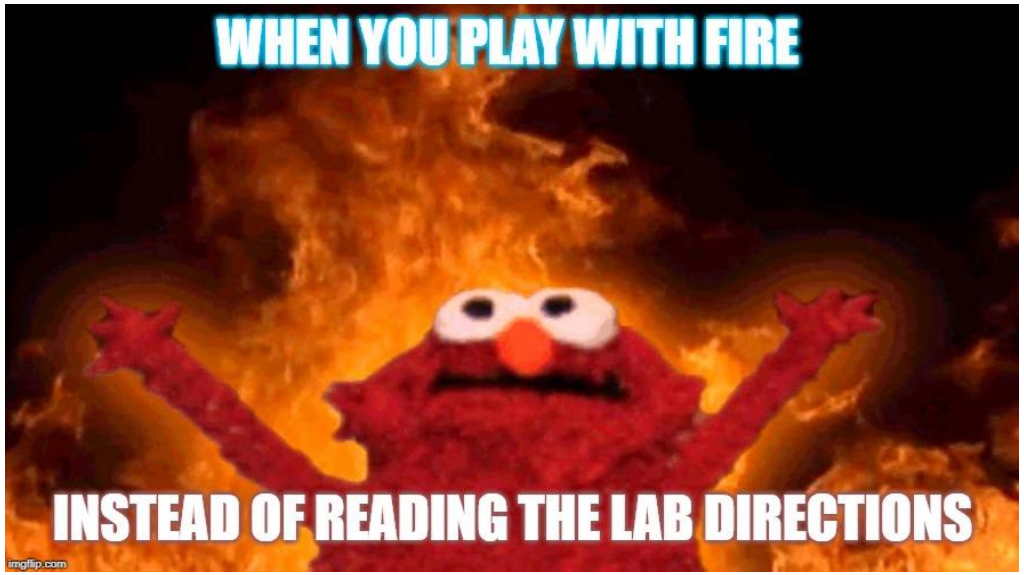
- Keep the workstation as clean as possible
  - ○Clean up spills immediately (except when someone is hurt)
  - ○One person keeps people out of the area, the other person gets the teacher or cleaning supplies
  - ○If a chemical spills on your skin, rinse the skin with water for 15 minutes. Do not rub your hands together, nor the area of the spill.
  - ○If the chemicals get into your eye, wash the chemical out for 15 minutes using the eye wash station (eye wash bottles in this class). Make sure to have the water hit your eye, not your eye lids.



"But that WASN'T a beaker of acid!
That was a cup of coffee from the cafeteria!"

DURING THE LAB:

- If burned by fire
  - For a **small burn**, run the burned area under cold water for 15 minutes
  - For a **large burn**, get the teacher's attention. If large enough, medical attention must be found out.
  - If someone is on fire, the **fire blanket** is quickly used to smother the flames.
- If a fire starts
  - Alert the Teacher and surrounding people in the area
  - All students should then evacuate the area. A small fire can be put out with an extinguisher by the teacher. Large fires require an evacuation of the building.

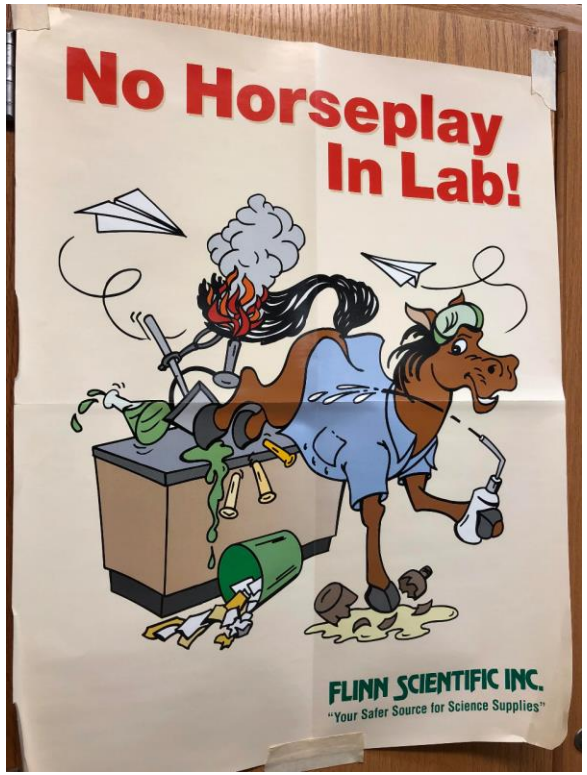


DURING THE LAB:

- Hold all **sharp objects** with the **blades facing down**
- **Never check how sharp a blade is with your hands**, fingers, thumbs, or other body parts
- Try to **avoid leaning** on any desks, chemicals can come into contact with your clothes
- Keep **electrical equipment away from water**
  - Also, unplug electrical equipment by the head of the plug; do not pull on the cord.
- **Broken glass** should be cleaned up while keeping other people away from the area

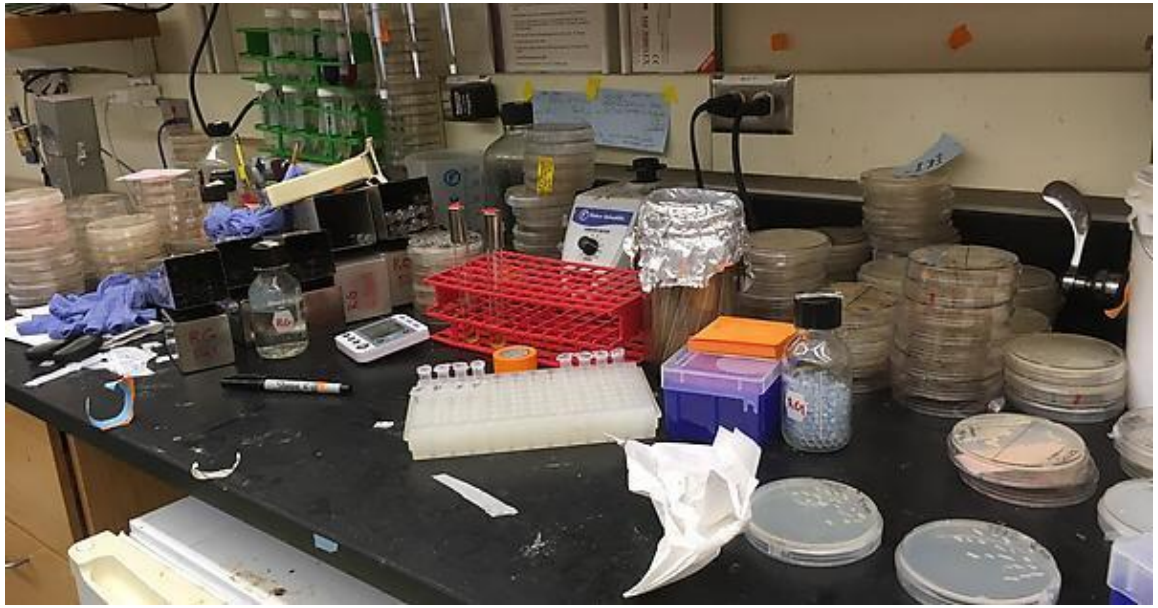
DURING THE LAB:

- No horseplay
- **Always ask the teacher** if unsure of the safety of something
- **Never taste** anything in the lab.
- **Never smell anything directly** in the lab. Hold the substance away from your body and waft
- **Be alert** while in the lab (no headphones)
- **Never eat or drink <u>ANYTHING</u> in the lab.**



AFTER THE LAB:

- Clean up
  - Dispose of materials properly
  - The teacher will bring out the chemical waste buckets if needed in an experiment.
- Wash all glassware
  - Put equipment away or dry the equipment on a drying rack (or paper towel)
- PPE must be worn until everyone in the lab has finished their experiments
- Wash your hands thoroughly



Safety Rules for the Science Lab

General

1. Always work under supervision and only on approved activities. Never change a procedure without your teacher's permission.
2. Make sure you know the procedure and have read it over before you start an experiment.
3. Make sure you know how to use your lab equipment properly before you start an experiment.
4. Always use appropriate protective equipment, such as a lab apron or protective eyewear. Tell your teacher if you are wearing contact lenses.
5. Do not wear loose clothing, sandals, or open-toed shoes.
6. Do not eat, drink, or chew gum in the laboratory.
7. Never engage in horseplay.
8. Know the location and use of all emergency equipment and emergency exits (Figure 1.2).
9. In case of an emergency, follow procedures your teacher has taught you. Use whatever emergency equipment is appropriate to respond to the emergency. Act immediately to protect people first and then equipment.

Glassware

10. Never use broken or chipped glassware. Dispose of it in a "sharps" bucket or as your teacher directs. Use clean glassware, and after use wash it, or put it in an approved place to soak.

Chemicals

11. Know the safety precautions and hazards for all chemicals you are using before you start your lab.
12. If you come in contact with a substance, wash the affected area immediately and thoroughly with water. If you get anything in your eyes, do not touch them. Wash them immediately and continuously for 15 minutes and inform your teacher.

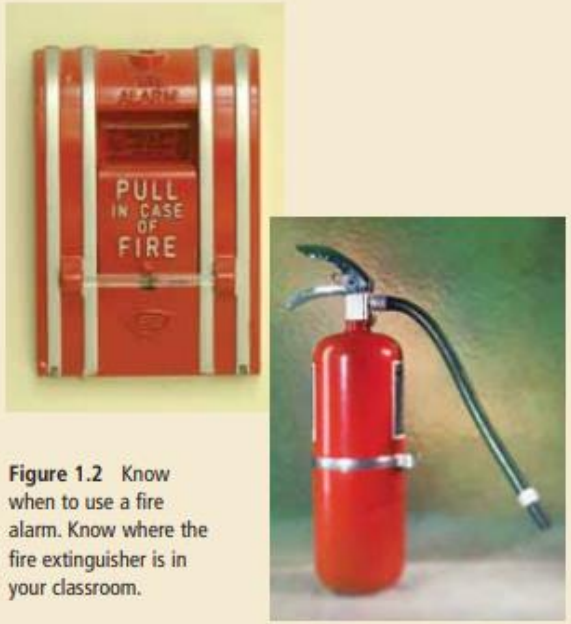


Figure 1.2 Know when to use a fire alarm. Know where the fire extinguisher is in your classroom.

13. Hold containers away from your face when pouring liquids.
14. Read labels on containers. Never use a chemical from a container that does not have a readable label. Take it to your teacher.
15. When in the lab, never put anything in your mouth such as fingers, equipment, hair, pencils, or chemicals that you are working with, even if they are food items.
16. Never return a chemical to its original container. Doing this could contaminate the original stock.
17. Never put any chemical down the sink or into the garbage without permission.
18. Clean up any spills according to your teacher's instructions.
19. If you are asked to smell a substance, never smell it directly. Hold the container at arm's length and waft fumes toward you. Gradually bring the container closer to your nose until you can smell the fumes safely (Figure 1.3).

Figure 1.3 Never smell anything in the lab directly. Always waft the fumes toward your nose.

20. When diluting a concentrated acid with water, add the acid to the water, not the water to the acid. This prevents sudden overheating of the water.

Hot Plates and Open Flames

21. Handle hot objects carefully. Be especially careful with a hot plate even if it looks as though it has cooled down.
22. Know how to light and operate a Bunsen burner.
23. Tie back long hair and avoid fuzzy clothing and long sleeves when you are in an area with open flames.
24. Never leave an open flame unattended, even for a moment. Assign someone else to watch it, or turn the flame off.

Electrical Equipment

25. Make sure your hands are dry when touching electrical cords, plugs, or sockets.
26. Pull the plug, not the cord, when unplugging electrical equipment.
27. Report frayed cords and any other damaged equipment to your teacher.
28. If any electrical component becomes hot during an activity, disconnect the circuit immediately.