

圖 甲

Picture



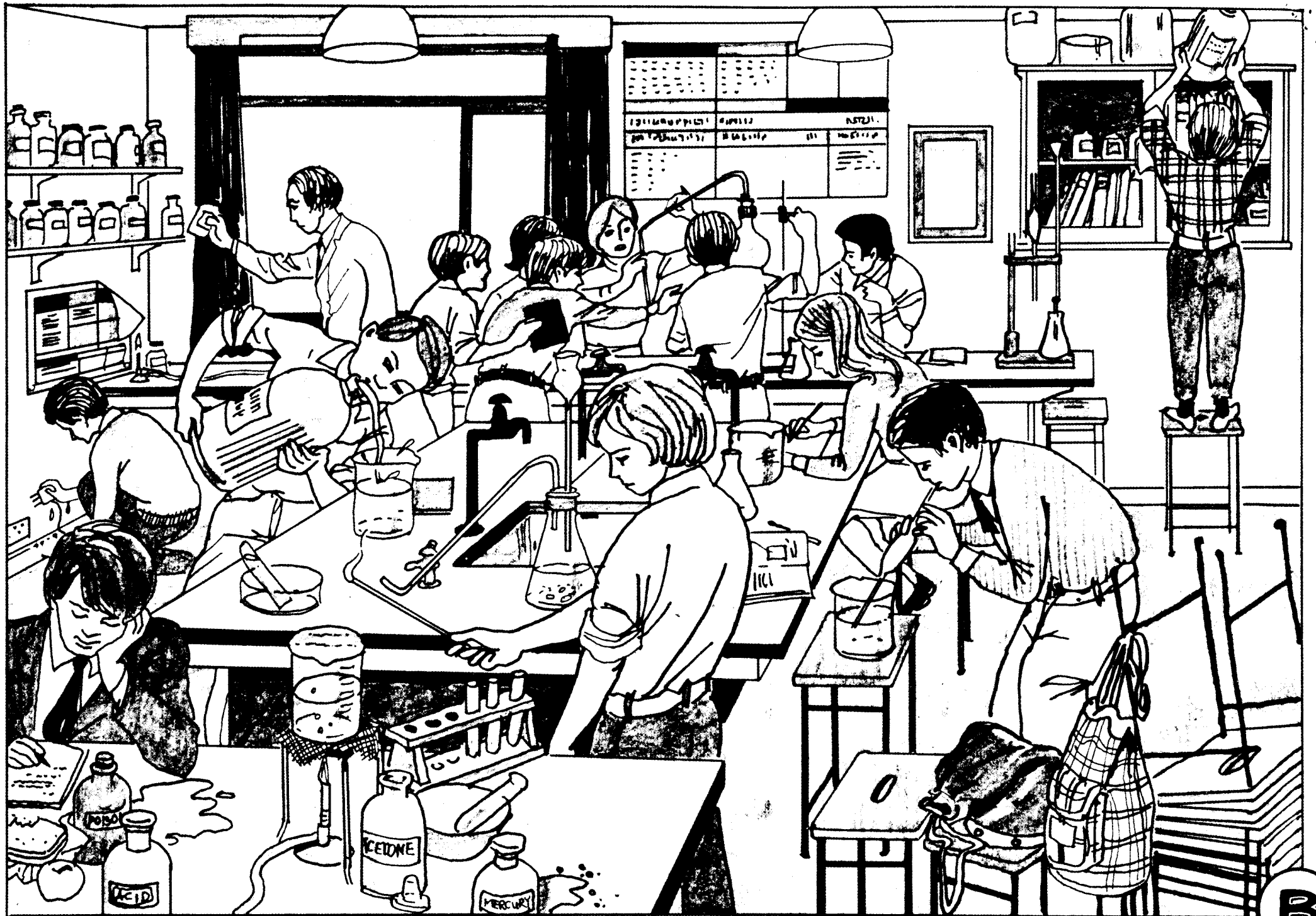


圖 乙

Picture



## 圖 甲

# 實驗室安全措施

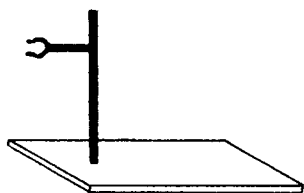
## 指出危險之處

此圖的目的在使中學生對防止實驗室意外有所認識。

每一位或一組學生可從圖中舉出其危險之處，如下所指者乃其中部份要點，而觀察力敏銳的學生可能發現更多。

## 圖中主要危險之處

- (一) 滑亮的地上有水。
- (二) 高大的儀器沿桌邊放置——移液管放在燒杯中，置於三腳架上。
- (三) 學童偶然將手觸及熱的三腳架上。
- (四) 受熱試管內之沸騰液體可能噴向學生。
- (五) 將滿盛液體之試管加熱。
- (六) 將盛有易燃或腐蝕性物料（例如乙醚或濃鹽酸）的瓶子置於易被撞倒的地方。
- (七) 如圖所示，鐵架裝置每易翻倒。
- (八) 玻璃瓶，膠管與其他儀器纏放一處，易被拖倒；桌上物件排列混亂，亦可發生意外，不用的玻璃瓶應該移去。
- (九) 用金屬螺絲批探究有電源之插座。
- (十) 以幼繩或線以支持重砝碼或其他重物（滑輪實驗）。
- (十一) 學童之長髮在本生燈火焰附近搖擺。
- (十二) 瓶中載有食物。
- (十三) 如圖所示液體從視平線上注入滴定管中。
- (十四) 阻塞出路。
- (十五) 示範實驗時，學童觀察過於接近。
- (十六) 學童在搬運物品時視線被所搬之物品遮擋。
- (十七) 在電箱上之安全告示位置太高，學童不易閱讀。



# 實驗室安全措施

## 指出危險之處

此圖的目的在使中學生對防止實驗室意外有所認識。

每一位或一組學生可從圖中舉出其危險之處，如下所指者乃其中部份要點，而觀察力敏銳的學生可能發現更多。

### 圖中主要危險之處

- (一) 地方狹小，過份擠迫，桌上之儀器易被碰倒。
- (二) 衣服可能拭及傾瀉於桌上的酸液。
- (三) 學童從巨大玻璃瓶中傾出液體。
- (四) 學童站立檯上提取高處之笨重儀器。
- (五) 櫃邊之瓶子可能墜下。
- (六) 學童用木條燃點從裝有長柄漏斗之氣體發生器所逸出之氣體。(若用此儀器以製造氫，則儀器中將含有空氣與氫之混合物而易於爆炸。)
- (七) 試管架沿桌邊放置。
- (八) 食品與毒性葯物同放一處。
- (九) 易燃溶劑(丙酮)直接加熱。
- (十) 汞傾瀉於桌上。
- (十一) 以口用移液管吸取容器內的液體，而管口僅在液面之下。
- (十二) 牆上的圖表因無圖釘釘牢而曲捲，可能被附近本生燈火焰燃着。
- (十三) 儀器不小心放置，開櫃門時每令儀器翻倒。
- (十四) 沒有支撐的儀器。
- (十五) 翻倒的檯子會使其他檯子相繼倒下。
- (十六) 以濕手取插頭插入有電源之插座中，並留意該插座是倒置者。
- (十七) 檯子及書包將通道阻塞。
- (十八) 女童之長髮未經縛緊，易被火焰所灼，致生危險。

# Picture A

## Laboratory Safety

### Spot the Hazards

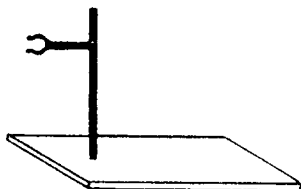
The purpose of this picture is to provide pupils in the middle range of the secondary school with an exercise in accident prevention in laboratories.

Each pupil or group of pupils is given a picture from which a list is made of the hazards found.

The main hazards are listed below. Observant pupils may find others.

### Some of the Main Hazards in the Picture

1. Water on a polished floor.
2. High apparatus standing near the edge of the bench—a beaker on a tripod stand with a long pipette sticking out of the beaker.
3. A child inadvertently putting his hand on a hot metal tripod.
4. A heated test tube pointed in such direction that boiling liquid could be ejected on to pupils.
5. A test tube being heated with an inappropriately large amount of liquid in it.
6. Bottles of inflammable or corrosive materials (e.g. either or corrosive hydrochloric acid) stored on the floor where they can be bumped into.
7. A retort stand assembled in such a way when used it will tip over—thus:
8. Rubber tubing trailing among bottles and other apparatus which might thereby be knocked over or swept off the bench. Cluttered benches can be a source of a variety of accidents. Bottles not in use should be removed from the working surface.
9. A metal screwdriver being used to explore a mains socket.
10. Heavy metal weights or other heavy objects being supported on thin string or wire (in the experiment with pulleys).
11. Long hair dangling near bunsen flames.
12. Bottles containing food.
13. Liquids being poured above eye-level—in this case into a burette.
14. Exit doors blocked.
15. Pupils watching demonstrations from too near a distance.
16. A pupil carrying loads that obscure the view of where he is walking.
17. The safety notices on the power unit are too high to be read easily by pupils.



# Picture B

# Laboratory Safety

## Spot the Hazards

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Each pupil or group of pupils is given a picture from which a list is made of the hazards found.

The main hazards are listed below. Observant pupils may find others.

### Some of the Main Hazards in the Picture

1. Over-crowding likely to cause pupils to knock apparatus off the bench.
2. Spilled acid on a bench in a position such that clothing might mop it up.
3. Pupil pouring a solution from a very large (Winchester) bottle.
4. A pupil standing on a stool to get at high apparatus, reaching for heavy apparatus from high up.
5. A jar over the edge of a cupboard, could fall off.
6. A pupil trying to light, with a taper, gas coming from a gas generation apparatus which includes a thistle funnel. (If hydrogen is being prepared this way the apparatus will contain an explosive gas-air mixture.)
7. A test tube stand on the edge of a bench.
8. Food amongst poisonous chemicals.
9. An inflammable solvent (acetone) being heated with a naked flame.
10. Mercury spilled on a bench.
11. Liquid being pipetted by mouth from a vessel in which the pipette tip is only just below the surface.
12. A chart on the wall curling off for lack of drawing pins, is capable of being ignited by the nearby burner.
13. Apparatus in such a position that it would be knocked over by opening cupboard doors.
14. Unsupported apparatus.
15. Combined hazards—e.g., stool falls over, hence knocking over other stools in a domino effect.
16. A boy with wet hands putting a plug in a mains socket—notice also that the socket is upside down.
17. Stools and bags blocking walking space.
18. Long hair, not tied, could be a fire hazard for the girls.