

# Safety capsule

## (1) Lead, tin and other soldering

1. Watch out for burns that can be caused by the iron at more than 200°C. (Do not wear rubber or latex gloves, these substances could melt on your hands.)
2. Wear safety glasses to protect yourself from solder projections.
3. Use a soldering iron rest to avoid setting fire to your clothing, hair, paper or plastic etc.
4. Do not shake the iron to clean it: use the sponge designed for the job.
5. Avoid touching the solder to your mouth or teeth - it is extremely toxic. (You must neither eat nor drink while soldering.)
6. Never solder components under tension.
7. Use in a well aired room or solder under the hood designed for this use in order to limit inhaling the vapours, since they are toxic.
8. Use a desoldering bulb to remove a faulty solder.
9. Wash your hands after your work, and clean the work table to avoid any risk of intoxication.

Ensure that any modification to this capsule does not compromise student safety. Any person at fault will bear the consequences of his choices.



# Safety Capsule

## (2) Hot glue gun



1. Watch out for burns: the gun usually attains temperatures of 120°C to 195°C.
2. Wear appropriate clothing to protect yourself against accidental drips (thigh protection, for instance).
3. Wear safety glasses to avoid projections of burning glue.
4. Place the glue gun in a safe place between uses, since it tends to drip. An aluminium plate would work well.
5. Do not work close to a water supply (tap, drinking fountain, etc.). Water and electricity are not a good combination.
6. Do not heat the glue to a greater temperature than that recommended by the manufacturer (in a flame, for example). The glue may emit toxic emanations.



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## Safety capsule

### (3) Retractable blade knife



1. Watch out for injury. Never place the hand holding the part in the trajectory of the blade.
2. Use a profiled metal ruler to guide straight cuts.
3. Use a clean, rigid, slip resistant work surface that may get slightly marked (piece of hard paneling).
4. Use a sharp blade, otherwise unnecessary effort could cause injuries.
5. Take the time to think about each of your gestures.
6. Use pliers to break off and remove the worn ends of blades.

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# Safety capsule

## (4) Hand drill



1. Tie long hair to avoid it becoming entangled around the chuck.
2. Wear safety glasses to protect against projections.
3. Do not wear bracelets, necklaces, jewellery, etc.
4. Clean the work surface of any debris that could lead to dangerous movements or that could hamper the proper operation of the drill.
5. Use a well sharpened bit, otherwise unnecessary effort could break the bit and cause injury.
6. Take the time to think about each of your gestures.
7. Do not work close to a water supply (tap, drinking fountain, etc.). Water and electricity are not a good combination.
8. Unplug the tool from the power source before changing a bit.



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# Safety capsule

## (5) Jigsaw



1. Wear safety glasses to protect against projections.
2. Tie long hair to avoid it becoming entangled in the mechanism.
3. Do not wear bracelets, necklaces, jewellery, etc.
4. Clean the work surface of any debris that could lead to dangerous movements or that could hamper the proper operation of the saw.
5. Firmly affix the materials to the work surface using clamps. That way, both hands can hold the saw thus avoiding injury.
6. Take the time to think about each of your gestures.
7. Use a sharp blade, otherwise unnecessary effort could cause injuries.
8. Do not work close to a water supply (tap, drinking fountain, etc.). Water and electricity are not a good combination.
9. Unplug the tool from the power source before changing the blade.
10. Equip the saw with a dust bag or use a mask.
11. Wear acoustic protection to avoid auditory problems if the exposure to noise attains 85 decibels for a period of 8 consecutive hours.



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# Safety capsule

## (6) Hand sander



1. Wear safety glasses to protect against dust.
2. Clean the work surface of any debris that could lead to dangerous movements or that could hamper the proper operation of the sander.
3. Do not work close to a water supply (tap, drinking fountain, etc.). Water and electricity are not a good combination.
4. Unplug the tool from the power source before changing the sandpaper.
5. Wear a dust mask and if possible, equip the sander with a dust bag.
6. Wear acoustic protection to avoid auditory problems if the exposure to noise attains 85 decibels for a period of 8 consecutive hours.



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# Safety capsule

## (7) Band saw



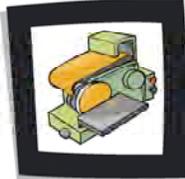
1. Wear safety glasses to protect against projections.
2. Tie long hair and roll your sleeves to avoid them becoming entangled in the mechanism.
3. Do not wear bracelets, necklaces, jewellery, etc.
4. Clean the work surface of any debris that could lead to dangerous movements or that could hamper the proper operation of the saw.
5. Use a sharp blade, otherwise unnecessary effort could cause injuries.
6. Take the time to think about each of your gestures. Keep your hands further than 5 cm. from the cut line at all times.
7. Use a pusher for small parts in order to keep your hands far from the blade.
8. Respect the security perimeter on the floor. The proximity of another person could distract the user.
9. Activate the dust hood or wear a dust mask.
10. Wear acoustic protection to avoid auditory problems if the exposure to noise attains 85 decibels for a period of 8 consecutive hours.



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# Safety capsule

## (8) Disk and band sanders



1. Wear safety glasses to protect against projections.
2. Tie long hair and roll your sleeves to avoid them becoming entangled in the mechanism.
3. Do not wear bracelets, necklaces, jewellery, etc.
4. Clean the work surface of any debris that could lead to dangerous movements or that could hamper the proper operation of the sander.
5. Take the time to think about each of your gestures.
6. Respect the security perimeter on the floor. The proximity of another person could distract the user.
7. It is compulsory that the dust hood be activated when using the disk or band sander. If you are in the presence of a cancer causing contaminant (such as silica) the mask is also mandatory.
8. Call the workshop supervisor if the belt becomes misaligned.
9. Wear acoustic protection to avoid auditory problems if the exposure to noise attains 85 decibels for a period of 8 consecutive hours.



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# Safety capsule

## (9) Press drill



1. Wear safety glasses to protect against projections.
2. Tie long hair and roll your sleeves to avoid them becoming entangled around the chuck.
3. Do not wear bracelets, necklaces, jewellery, etc.
4. Careful! Risk of serious injury! Firmly affix materials to the table using clamps to avoid a part being hooked to the bit and spun around at great speeds.
5. Adjust the height and depth of the table and tidy the work surface before starting the drill.
6. Use a well sharpened bit, otherwise unnecessary effort could break the bit and cause injury.
7. Remove the chuck key immediately after having tightened the drilling tool.
8. Take the time to think about each of your gestures.
9. Respect the security perimeter on the floor. The proximity of another person could distract the user.
10. Unplug the tool from the power source before changing a bit.



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# Safety capsule

## (10) Hot plate



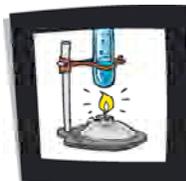
1. Know where to find the first aid kit and safety equipment and learn how to use it (fireproof blanket, fire extinguisher, eye rinse, fire alarm, etc.)
2. Watch out for burns: the plate stays hot for quite a while.
3. Tie long hair and roll your sleeves to avoid them coming into contact with the hot plate and catching fire.
4. Wear safety glasses to protect against projections.
5. Wear protective clothing to guard against accidental projections.
6. Never direct the opening of a test tube towards yourself or someone else.
7. Use the appropriate tongs to manipulate laboratory glassware (beaker or test tube tongs etc.)
8. Take the time to think about each of your gestures.
9. Never use flammable substances close to a flame or hot plate.



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# Safety capsule

## (11) Fuel burner



1. Know where to find the first aid kit and safety equipment and learn how to use it (fireproof blanket, fire extinguisher, eye rinse, fire alarm, etc.)
2. Watch out for burns! The flame may not be visible in daylight.
3. Tie long hair and be careful with your sleeves to avoid them coming into contact with the flame and catching fire.
4. Wear safety glasses to protect against projections.
5. Wear protective clothing to guard against accidental projections.
6. Never direct the opening of a test tube towards yourself or someone else.
7. Careful: flammable! Do not fill the burner with fuel close to a flame or if the burner is still hot. The fuel could ignite and cause serious injury.
8. Use the appropriate tongs to manipulate laboratory glassware (beaker or test tube tongs etc.)
9. Take the time to think about each of your gestures.



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# Safety capsule

## (12) Acid solutions



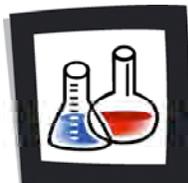
1. Careful! Acids are corrosive substances.
2. Wear safety glasses to protect against splashing. In case of contact with the eyes, rinse them immediately using the eye wash in the classroom.
3. Tie long hair and watch your sleeves to avoid any contact with the acid and to avoid spilling.
4. Never smell emanations directly. Direct the vapours towards your nose with your fingers.
5. Wear protective clothing in case of accidental projections.
6. In case of contact with your skin, wash it off with water and always wash your hands at the end of manipulations.
7. Take the time to think about each of your gestures.
8. Clean the work surface after manipulations to pick up any possible spillage.

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# Safety capsule

## (13) Basic solutions



1. Careful! Basic solutions are corrosive substances.
2. Wear safety glasses to protect against splashing. In case of contact with the eyes, rinse them immediately using the eye wash in the classroom.
3. Tie long hair and watch your sleeves to avoid any contact with the base and to avoid spilling.
4. Never smell emanations directly. Direct the vapours towards your nose with your fingers.
5. Wear protective clothing in case of accidental projections.
6. In case of contact with your skin, wash it off with water and always wash your hands at the end of manipulations.
7. Take the time to think about each of your gestures.
8. Clean the work surface after manipulations to pick up any possible spillage.

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# Safety capsule

## (14) Hydrogen



1. Know where to find the first aid kit and safety equipment and learn how to use it (fireproof blanket, fire extinguisher, eye rinse, fire alarm, etc.)
2. Careful! Hydrogen is a flammable and highly explosive substance. During manipulations, only a small quantity (less than 40 ml.) should be used.
3. Wear safety glasses to protect against projections. If hydrogen becomes mixed with the oxygen in the air, a violent explosion may make glassware shatter.
4. Tie long hair and be careful with your sleeves to avoid them catching fire.
5. During experiments, never direct the opening of a test tube towards yourself or someone else.
6. Take the time to think about each of your gestures.



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## Safety capsule

### (15) Dry ice (Wilson chamber)



1. Know where to find the first aid kit and safety equipment and learn how to use it (fireproof blanket, fire extinguisher, eye rinse, fire alarm, etc.)
2. Be careful at low temperatures! Dry ice is solid  $\text{CO}_2$  that changes to a gaseous state by sublimation at  $-78.5\text{ }^\circ\text{C}$ .
3. Wear gloves or use tongs. Contact with skin may cause frostbite or cold burns.
4. Wear safety glasses to protect against projections.
5. Wear protective clothing in case of accidental projections.
6. Take the time to think about each of your gestures.



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## Safety capsule

### (16) Source of radioactivity (Wilson chamber)



1. Watch out for radiation! Even though the isotopes present in class are not very powerful, they are nonetheless dangerous.
2. Handle containers with gloves or tongs, holding them by the cap. Never touch the eye of the needle, since the isotope is there.
3. Wear safety glasses to protect against projections.
4. Wear protective clothing in case of accidental projections that would contaminate your clothing.
5. Avoid touching your mouth during manipulations. (You must neither eat nor drink).
6. Wash your hands after your work to eliminate any possibility of contamination.



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