South Bristol Amateur Radio Club
Lesson 25 - Safety
Syllabus 9a.1, 9b.1, 9b.2, 9b.3, 9b.4, 9b.5, 9b.6, 9c.1, 9c.2, 9c.3, 9c.4, 9d.1, 9d.2, 9d.3, 9d.4, 9e.1, 9e.2, 9e.3

OK let's start with a positive note. Amateur Radio is a safe hobby.

Now let's caveat that a little bit. Some of the things we do require a degree of common sense and a tad of respect. Remember; we are playing with electricity and RF signals and erecting antennas and using tools. As long as you think before you act; everything should be fine.

The golden rule has to be that if you are:

- unsure of what to do
- unsure of the tools required
- unsure of your capability

then seek advice or assistance.

The points below should be used as a general guide when working:

1. Soldering
    a. Recall that a soldering iron stand must be used to avoid skin contact with the hot bit of the iron when not in use.
    b. Understand that soldering work benches must be well ventilated to avoid inhalation of solder fumes, which can cause breathing problems particularly to asthmatics.
    c. Understand that eye protection must be worn when soldering to prevent solder from splashing into the eyes.
2. Use of Hand Tools
    a. Understand that screwdrivers, drills, saws, and files must be handled with care to avoid cuts to the hands and face.
    b. Understand that any items being drilled, sawn or filed must be securely held in a vice or similar device to prevent slipping or rotating.
    c. Understand that a chuck key must be removed prior to operating using a drill to prevent the key being ejected at high speed.
    d. Understand that using a centre punch will help to prevent a drill bit slipping.
    e. Understand that eye protection must be worn when drilling to prevent eye damage from small metal particles (swarf).
    f. Understand the reasons why a bench mounted pillar drill is safer than a hand-held drill.
3. Working at Heights
    a. Recall that a ladder should be used at the correct angle (4:1 height to base ratio).
    b. Understand that ladders must be secured at the top or securely held at the bottom to prevent them slipping.
    c. Understand why it is important not to over-reach from a ladder to prevent falling off.
    d. Understand why a tool belt or similar device to carry tools should be used and that it will help prevent falling objects.
    e. Understand the need to wear hard hats when working at height or when others are

working at height.

4. Electricity
    a. Recall that dangerous electric shock can result from antennas and ladders coming into contact with or attracting arcing from overhead lines.
    b. Understand that a fuse must be correctly rated to provide proper protection and be able to select an appropriate fuse using the formula: current = power/230 where 230 is the nominal mains voltage.
    c. Understand that a Residual Current Device (RCD) will give better protection against electric shock than relying solely on a conventional fuse (which only protects against excessive current) and the earth system.
        i. NOTE: The student should appreciate that an RCD will detect currents to earth of about 30mA whereas a fuse will only blow at several Amps and only when the fault is a short circuit (L – N or L – E). The mechanics of RCD operation (differential current sensing) is not examined.
    d. Understand that large or high voltage capacitors can store dangerous electric charges and must be discharged before working on equipment.
5. RF
    a. Recall that the main hazard to health of electromagnetic radiation is the heating of body tissue.
    b. Recall that guidance on safe levels of RF radiation is available from Government and International bodies (HPA – Health Protection Agency and ICNIRP – International Committee on Non-Ionising Radiation Protection).
    c. Recall why it is unwise to look down a microwave frequency waveguide or to stand close to or in front of high gain antennas as they may be in use.