Listen to the following text on soldering and complete it with the words in the box.

appear • elevated • flux • joint • layer • pre-coat • quickly • solder
• soldering iron • surfaces • temperature

General Soldering Tips

a. Clean the ......................................... to be soldered and apply the ...............................

b. Tin the surfaces, that is .............................. them with a thin film of solder. This may be carried
   out with a ......................................... and resin-cored solder.

c. Solder as ......................................... as possible.

d. Use the lowest possible soldering ......................................... that yields acceptable joints. If the
   temperature is insufficient, there will be a layer of solid ........................................ beneath the melted
   solder and amalgamation will not take place.

e. Avoid repeated soldering just to make the ................................. look better. Added exposure to
   high temperatures only increases the inter-metallic ............................................. The joint may look pretty
   but is in fact weaker.

f. Avoid ......................................... operating temperatures for the end product. Keep it well below the
   soldering temperature as much as possible.

g. Remove any flux and inspect the joint which should ............................... fresh and bright.
PAIR WORK. Follow the instructions of the previous activity and work out a dialogue between two students: Student A has problems soldering; Student B gives advice.

<table>
<thead>
<tr>
<th>STUDENT A</th>
<th>STUDENT B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask what you have to do before soldering</td>
<td>Answer the question</td>
</tr>
<tr>
<td>Ask what you have to do next</td>
<td>Answer the question</td>
</tr>
<tr>
<td>Ask if you need to use a high soldering temperature</td>
<td>Answer the question</td>
</tr>
<tr>
<td>Ask if you have to repeat the operation</td>
<td>Answer the question</td>
</tr>
<tr>
<td>Ask why</td>
<td>Answer the question</td>
</tr>
<tr>
<td>Ask what you have to do at the end of the soldering</td>
<td>Answer the question</td>
</tr>
<tr>
<td>Thank</td>
<td>Answer</td>
</tr>
</tbody>
</table>
Fill in the following table with the missing information.

<table>
<thead>
<tr>
<th>TECHNIQUE</th>
<th>PROCEDURE</th>
<th>MATERIALS/PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Only stronger plastics are suitable for this method since the joint must survive the strain of assembly, service load, and possible repeated use.</td>
</tr>
<tr>
<td>Hot-gas welding</td>
<td>The parts are heated by pressing them together and vibrating one of the parts at 120 to 240 Hz, in the plane of the joint. After 2 to 3 sec, vibration is stopped and pressure is maintained while the softened plastic cools.</td>
<td></td>
</tr>
<tr>
<td>Ultrasonic welding</td>
<td></td>
<td>This technique is suitable for difficult-to-weld plastics such as polypropylene.</td>
</tr>
<tr>
<td>Fusion bonding</td>
<td>This technique uses the breakdown of plastic under high voltages and frequencies (13 to 120 MHz) to produce dielectric heating and fuse the plastic.</td>
<td>This process is limited to thermoplastics.</td>
</tr>
</tbody>
</table>
**Complete the following sentences.**

a. In oxyacetylene welding, flame and pressure can be varied according to ..................................................

b. Forge, friction and ultrasonic welding are examples of .................................................................

c. Electric arc welding is widely employed because it allows obtaining ................................................ and avoiding ....................................................................................................................................................

d. Gas welding equipment includes ..................................................................................................................

e. Mechanical joining is used as an alternative to welding or brazing when ..............................................

f. Mechanical fasteners are usually classified as ..........................................................................................

g. Hole preparation in mechanical joining involves ......................................................................................

h. Self-tapping screws or bolts are often employed with ................................................................. because they do not require ........................................................................................................................................

**Match the following sentence beginnings and ends.**

a. Dielectric welding uses the breakdown of plastic

b. Hot-gas welding is a low-speed process during which a thermoplastic rod

c. Only stronger plastics are suitable for mechanical fastening since

d. In solvent bonding the plastic molecules mix together, and

e. Solvent-bonded parts must be pressed together for 10 to 30 sec before

f. Soldering and brazing and most adhesive bonding methods

g. Solders are commonly classified as soft and hard solders,

h. Soldering is an ancient technique that has been used practically

i. Both in soldering and brazing the filler metal distributes itself

1. the joint must survive the strain of assembly, service load, and possible repeated use.

2. the joined parts can be handled.

3. under high voltages and frequencies (13 to 120 MHz) to produce dielectric heating and fuse the plastic.

4. is heated with the parts to be joined until they soften and can be pushed together.

5. as long as humans have been making items out of metal.

6. depending upon their melting points and strengths.

7. between the surfaces to be bonded by capillary action.

8. the parts bond when the solvent evaporates.

9. are usually defined as “liquid-solid” state processes.
Complete the chart with the precautions on the right.

<table>
<thead>
<tr>
<th>Precautions</th>
<th>Type of hazard</th>
<th>Initials</th>
<th>Pictogram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explosive</td>
<td></td>
<td>E</td>
<td>!</td>
</tr>
<tr>
<td>Extremely flammable</td>
<td></td>
<td>F+</td>
<td>!</td>
</tr>
<tr>
<td>Highly flammable</td>
<td></td>
<td>F</td>
<td>!</td>
</tr>
<tr>
<td>Oxidising</td>
<td></td>
<td>O</td>
<td>!</td>
</tr>
<tr>
<td>Very toxic</td>
<td></td>
<td>T+</td>
<td>💀</td>
</tr>
<tr>
<td>Toxic</td>
<td></td>
<td>T</td>
<td>🧟‍♂️</td>
</tr>
<tr>
<td>Harmful</td>
<td></td>
<td>Xn</td>
<td>❌</td>
</tr>
<tr>
<td>Corrosive</td>
<td></td>
<td>C</td>
<td>🧵</td>
</tr>
<tr>
<td>Irritant</td>
<td></td>
<td>XI</td>
<td>❌</td>
</tr>
<tr>
<td>Dangerous for the environment</td>
<td></td>
<td>N</td>
<td>🌳</td>
</tr>
</tbody>
</table>

**PRECAUTIONS**

- Avoid contact with eyes and skin. Do not breathe vapours.
- Keep away from sources of heat, particularly sparks and flames.
- Do not discharge in the soil or emit in the air. Dispose of at suitable collection points.
- Avoid contact with skin, eyes and clothing. Do not breathe vapours.
- Avoid heat, bumps, frictions, fire, sparks, collision.
- Keep away from sources of heat, particularly sparks and flames.
- Avoid contact with the body and do not breathe vapours, as some substances may cause carcinogenic effects, genetic alterations and sterility. Do not misuse!
- Avoid contact with flammable substances. Serious risk of combustion, possible spread of non-extinguishable fires.
Quotes are often effective workplace safety reminders. First connect each of the following terms or expressions to its definition and then read the list of safety reminders below.

a. absence of mind 1. To feel sorry for something bad or wrong that you did.
b. accident 2. A country whose ruler is a king or a queen.
c. alert 3. A mental condition.
d. alive 4. The state of being protected from danger or harm.
e. aware 5. Watchful and prompt to meet danger or emergency.
g. prevent 7. An event that occurs by chance.
h. repent 8. Continuing to exist, not dead.
i. safety 9. To keep something from happening.
j. state of mind 10. Conscious, awake.

• Alert today, alive tomorrow.
• Safety is a state of mind – accidents are absence of mind.
• Make safety a way of life.
• Is better to lose one minute in life... than to lose life in a minute.
• Your workplace is your kingdom. Make it a safe one.
• The safe way is the best tools.
• Ensuring the only way.
• Safety... yesterday, today and tomorrow.
• Life did not begin by accident. Don’t end it as one.
• Prepare and prevent instead of repair and repent.
• Safety is a full-time job, don’t make it a part-time practice.
• Safety is everybody’s business.
• Be alert, be aware, be alive.