

## Sample General Safety Test

# Technology and Engineering Education Introduction to Manufacturing Technology General Safety Test

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Instructor: \_\_\_\_\_

**Section 1 directions:** Please read each question carefully and circle the letter (a, b, c, or d) with the most accurate response. If you need assistance, please raise your hand, and your instructor can assist you.

- 1) Eye protection such as safety glasses must be worn:
  - a) Only when operating power equipment
  - b) At all times when in the shop
  - c) Only for those students who do not already wear prescription glasses
  - d) When you want to
  
- 2) If you find a power tool with a damaged power cord or with a switch that does not work, what should you do?
  - a) Report the condition to the instructor immediately so the tool can be locked up until it is repaired
  - b) Try to fix the problem yourself
  - c) Put it back into the tool cabinet, as it does not work
  - d) Report the defect to the instructor after you have finished using the tool
  
- 3) When disconnecting portable power tools from a power receptacle, you should:
  - a) Remove your safety glasses to better see the cord end
  - b) Not remove it, but leave it plugged in
  - c) Pull on the plug end, and not the cord
  - d) Pull on the cord, and not the plug end
  
- 4) Long hair, loose clothing, jewelry, and long sleeves need what kind of attention?
  - a) All clothing should be tucked in or rolled back (such as long sleeves). Loose jewelry must be removed, and long hair should be tied up.
  - b) Long hair must be tied up, but long clothing does not need special attention
  - c) Long sleeves and loose clothing must be rolled up and tucked in, but long hair is not a problem
  - d) Long sleeves and loose hair and jewelry are not safety hazards, as all machines have the necessary safety guards to keep them from becoming tangled in a moving part

- 5) An 'Operator Zone' refers to:
- a) The area of the shop floor where all students except the machine operator must stand
  - b) The area next to the telephone in case there is a need to call for emergency help
  - c) The area of the shop floor where the machine operator only should stand
  - d) The floor space around the instructor's desk

**Section 2 directions:** Please read each question carefully and write your answer in the blank provided using your best penmanship. If you need assistance writing or spelling, please raise your hand, and your instructor can assist you.

- 6) "Forcing" your work into a machine means that you are \_\_\_\_\_ it too hard.
- 7) It is dangerous to use a hammer with a loose handle because the hammer head may \_\_\_\_\_.
- 8) Paint, enamel, lacquer or solvents must not be used near flames or sparks because they are \_\_\_\_\_.
- 9) Before using any power machine, for the first time, you must get the permission of your \_\_\_\_\_.
- 10) The color 'Orange' on machine parts means the parts are \_\_\_\_\_.

**Section 3 directions:** Please read each question carefully and circle either "T" if the statement is true, or "F" if any part or all of the statement is false. If you need assistance, please raise your hand, and your instructor can assist you.

- 11) T or F: Hot metal thrown into water in order to cool it off can create steam hot enough to burn skin.
- 12) T or F: Once the metal is no longer bright orange from welding, it is cool enough to pick up with your hands.
- 13) T or F: Wearing gloves and aprons can help sparks and hot metal from touching your skin.
- 14) T or F: Since you weld with a welding helmet that has a dark safety glass lens, you do not need to wear your regular safety glasses or goggles.
- 15) T or F: Ultraviolet (UV) light from the welding arc can cause sunburned skin

**Section 4 directions:** Please read each question carefully and provide a short answer. If you need assistance, please raise your hand, and your instructor can assist you.

16) Explain why oily rags or rags soaked in paint and other solvents must be stored in a metal, air-tight container when not in use.

17) Explain why great care must be taken when handling all metal around a welding and grinding area, not just your own project.

18) Explain what you should do if you find a tool that is broken.

19) Explain what you should do in the event of an accident.

20) Explain why the sheet metal pictured on top of this table is a safety concern.

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**Section 5 directions:** Please look at each of the following pictures and identify the safety violation taking place. If you need assistance, please raise your hand, and your instructor can assist you.

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**Section 6 directions:** Please read each question carefully and circle the most accurate of the two answers in parentheses ( ). If you need assistance, please raise your hand, and your instructor can assist you.

26) You should not talk to another student or to the instructor while he or she is (operating a machine in the shop). (reading drawings in the classroom).

27) Machines should come to (full speed) (full stop) before adjustments are made.

28) Safety guards on power tools are (in the way so remove them). (designed to provide maximum protection).

29) Common sense and good judgment will (avoid most accidents). (increase the amount of accidents).

30) "Horseplay" is considered (forbidden) (acceptable if not dangerous) at all times in the shop.

## **Suggestions for Equipment-Specific Tests**

Equipment-specific safety tests must match exactly, down to the manufacturer, what you have in your shop. Review the manufacturer's details and requirements on safety. Contact local assessment personnel for directions on producing a solid examination tool. Look to the state office of education for additional resources if you still need help producing adequate tests. Below are unspecified guidelines for typical manufacturing chemicals and equipment:

### **Handling Chemicals**

1. Do not wash hands in cleaning solvents. Absorption of these liquids through the skin can cause serious illness.
2. Do not handle chemicals of any type unless you are aware of the potential skin and inhalation hazards. Consult the appropriate MSDS.
3. Wear appropriate skin, face, eye, and hand protection when moving or handling bulk chemicals.
4. Always wear chemical resistant gloves, aprons, and complete eye protection when handling corrosive chemicals. If chemicals contact skin, wash with large amounts of water immediately.
5. Do not open chemical containers which have been stored in the sun unless proper care is taken. Many chemicals will build up pressure in the container when exposed to heat.
6. Clean up small chemical spills immediately if you can do it safely; otherwise, notify supervisor.

### **Grinding Machines**

7. Grinding wheels and wire brushes shall not be operated in excess of the speed recommended by the manufacturer. Check the recommended rpm against that of the shaft or motor before mounting a new wheel. Check all grinding wheels for chips and cracks before use.
8. Face shields, safety glasses, or chipper's goggles shall be worn at all times when grinding or using a wire brush.
9. Gloves shall not be worn while grinding, nor will cloth be used to hold work pieces.
10. Do not operate grinding machines unless metal wheel hoods are in place. Do not apply work too quickly to a cold wheel.
11. Tool rests shall be secured at all times and adjusted to within 1/8 inch of the wheel. Top wheel guards shall be adjusted to within 1/8 inch of the top of the wheel.
12. Disc grinder tables shall be adjusted to within 1/8 inch of the disc.
13. When a grinder is first turned on, do not stand in line with the grinding wheel. If any wobble or vibration is noticed, the machine must be turned off and repaired.
14. Except where specifically designed, one should not grind on the sides of the grinding wheel.
15. Do not grind wood, aluminum, copper, or other soft materials on wheels designed for steel and iron.

## **Metal Lathes**

1. Chip guards should be used in operations that could endanger the operator or others nearby.
2. Chip breakers shall be used whenever practical. Tool ways must be kept clear and clean.
3. Tools should not be set or adjusted while the lathe is in operation. Tools and chucks must be checked for defects before use.
4. Brushes or chip pullers shall be used for removing chips. Operators shall not use their hands, or compressed air in excess of 30 psi, to remove chips.
5. Heavy chucks, face plates, or other heavy equipment should never be handled without proper lifting equipment.
6. Tools or other equipment shall not be stored on top of the head stock.
7. Rotating stock extending into aisles should be marked with a warning device (yellow tape, rag, or tag) or contained by physical barrier.
8. Magnesium or similar metals shall not be machined unless appropriate fire protection is provided.
9. Do not stop lathe with tool bit in the cut, or with feed clutch engaged. Hand pressure should not be used to stop free spinning chucks.

## **Metal Cutting Band Saws**

1. Before starting an operation, be sure the machine is set for the recommended speed, feed, and blade type for the material to be cut.
2. A complete face shield shall be worn when blades are electrically welded on the machine.
3. The portion of the blade between the upper wheel and the saw table should be completely enclosed except for the point at which the cut is made.
4. Inspect and adjust the table and blade guide to be sure that small parts cannot jam between the table and moving blade.
5. The length of the exposed blade should not be more than 3/8 inch greater than the thickness of the stock being cut.
6. Use pliers, tongs, jigs, or other hold-down devices when sawing small parts that could jam between the blade and saw guide.
7. Warn personnel or install barriers during sawing or welding operations that throw hot sparks onto nearby work stations.

## **Metal Planers, Shapers, drilling and Boring Machines**

1. Always use brushes or chip pullers to clean the work area. Operators shall not use their hands or compressed air in excess of 30 psi to remove chips.
2. Always clamp the work securely before starting the cut. Do not measure the job while the machine is in operation.
3. Always remove the stroke-change screw handle before starting the shaper.
4. Do not place heavy parts or tools on the machine without the use of approved lifting equipment.
5. Only soft metal or plastic hammers should be used when setting up jobs on a drill press or boring mill.

6. Adjustable wrenches should not be used on the machine parts or equipment. Properly sized box or open-end wrenches should be used.
7. Do not operate drill presses with dull tools.
8. Never make adjustments on the chuck when the machine is in motion.
9. Boring mill operators should never attempt to make measurements near the tool, reach across the table, or adjust the work while the spindle is turning.
10. When deep holes are being drilled beyond the flutes of the drill, the drill should be withdrawn frequently to keep it free of chips.
11. Stop the machine before attempting to clear work that has been jammed