This workbook is to be completed in conjunction with the resources and information provided by your instructor. Complete the questions in the spaces provided, or on separate pages as required.

Throughout the module and upon completion, the students will be able to:

* Understand the hazards involved with gasoline and other chemicals
* Understand the by-product hazards of burning gasoline
* Understand the three types of fires and how to extinguish them
* Understand the theory behind two and four cycle engines
* Recognize the many fasteners that keep an engine together
* Disassemble and re-assemble a small engine according to specifications

***Carbon Monoxide Questions***

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1. Describe CO.  
   CO is a poison that is colorless, odorless, and tasteless gas
2. What is the source of CO when discussing small engines?  
   The result of incomplete combustion of a solid, liquid or gas fuel that is carbon based.
3. Name three potential sources of CO in your home.  
   Natural Gas hot water heater, natural gas furnace, natural gas oven / range
4. What does CO do to the human body?  
   The hemoglobin of the blood is attracted to CO three hundred (300) times more than oxygen. When CO is combined with the hemoglobin, it reduces the amount of hemoglobin that is available to carry oxygen to the body’s tissues. If large amounts of CO combine with the hemoglobin, the body becomes starved for oxygen and suffocation occurs
5. How do you know you might be suffering from the onset of CO poisoning?  
   Tightness across the forehead, throbbing temples, weariness, weakness, headache, dizziness, nausea, a decrease in muscle control, increased pulse and increased respiration
6. What is the most effective way to prevent CO poisoning?  
   Ensure proper ventilation is present and working properly when the fuels are being burned

Test your risk by circling T (True) or F (False) to the following questions:

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| --- | --- | --- |
| T | F | Carbon monoxide is normally harmless but can be dangerous at high levels. |
| T | F | Carbon monoxide has a distinctive odor you can smell. |
| T | F | Carbon monoxide problems are caused by old heating systems. |
| T | F | Fuel-burning equipment like furnaces and fireplaces should be inspected every two to three years to make sure it's safe. |
| T | F | It's OK to use a gas barbecue or run a car in a garage as long as the garage door is open. |
| T | F | There are no physical symptoms of carbon monoxide poisoning. |
| T | F | You should only call 911 if your carbon monoxide alarm keeps going off after you've opened the windows and doors. |
| T | F | Certain levels of carbon monoxide can kill but survivors can expect a complete recovery. |
| T | F | The best way to protect against carbon monoxide poisoning is to have a CO alarm in your home. |
| T | F | All carbon monoxide alarms sold in Canada are certified to Canadian safety standards. |

***All of the statements were false. This is a good opportunity to have a discussion about CO safety.***

1. Carbon monoxide is a poisonous gas which is dangerous at any level. It's created when fuels like wood, oil and gas burn. Normally, the small amounts caused by our heating equipment are vented to the outside and do not build up inside.
2. Carbon monoxide is odourless, colourless and tasteless which is why it's often called the "silent killer".
3. Carbon monoxide builds when the air circulating through our homes and heating systems doesn't get vented properly. Venting problems such as birds building nests in chimneys can happen in homes of any age.
4. Heating systems (furnaces, fireplaces, wood burning stoves, and chimneys) should be checked every year before the heating season by a certified heating technician.
5. There is always the risk that carbon monoxide will leak into the house even if the garage door is open.
6. Carbon monoxide poisoning has symptoms that are similar to the flu: nausea, headache, burning eyes, confusion, drowsiness, and loss of consciousness. The key difference is that there is no fever with CO poisoning. The symptoms tend to disappear when the person gets fresh air. These are all warning signs.
7. If anyone feels ill - get everyone, including your pets, out of the house regardless if the alarm is sounding or not. Call 911 or your local fire department for help. Once the source of the CO is found - stay out of your home until repairs are complete. If no one is ill, ventilate the building by opening all windows and doors. Reset the alarm. If it continues to sound, call a certified heating technician to check for carbon monoxide.
8. Many victims of carbon monoxide poisoning recover with treatment. However, in very severe cases, CO poisoning can cause permanent brain damage.
9. The first line of defense against carbon monoxide poisoning is prevention through annual inspections of your home heating equipment including vents and chimneys. Alarms are a good second line of defense and every home should have them.
10. Not all carbon monoxide alarms sold in Canada are certified to Canadian safety standards. To make sure you're buying one that is, look for the CSA or ULC symbols.

***Gasoline Questions***

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1. What are some chemicals that make up the BTEX compounds (which we refer to as gas)?  
   Benzene, toluene, ethylbenzene, xylene
2. What is the most common way to be exposed to gasoline?  
   Fumes from re-fueling vehicles and in low areas such as basements, crawl spaces and living areas
3. Why should you wash out cloths soaked in gasoline in cooler water?  
   Because the hotter the cleaning water is the more fumes will be created when the gasoline washes out of the cloths and evaporates into the air
4. What class fire is a gasoline fire? B
5. What is MTBE?  
   methyl tertiary - butyl ether
6. What was used in the 1970’s as an anti-knocking agent in gasoline?  
   Lead
7. What is gasoline made from?  
   Processed crude oil and is a pale brown or pink liquid with a strong odor.
8. Name three symptoms of gasoline exposure by breathing  
   (Any three) headaches, dizziness, nausea, vomiting, confusion and breathing difficulties
9. Name three symptoms of gasoline poisoning by swallowing.  
   (Any three) mouth, throat and stomach irritation, nausea, vomiting, dizziness and headaches
10. Name three symptoms of gasoline poisoning by skin contact.  
    Rashes, redness and swelling
11. What should you do if anyone were to swallow gasoline?

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**Do not** induce vomiting and call 911

***Fires & Fire Extinguishers***

1. Why should you not walk on an area that has been recently extinguished?  
   The fire could re-ignite or the extinguisher could run out
2. Which direction do you point the flow of the fire extinguisher?  
   Stand several feet from the fire, point the fire extinguisher down towards the base of the fire and sweep back and forth
3. What is the “buddy system”?  
   Have someone back you up when you are using a fire extinguisher (stand behind you and give you standing support)
4. What gets cold on fire extinguishers while you are using them?  
   The metal parts of the fire extinguisher
5. What is the fuel in a class D fire? Combustible metals
6. What fire extinguisher should be used for a class C fire? Non-conducting extinguishing agents such as dry chemicals or carbon dioxide
7. Burning trash, wood and paper is an example of what type of fire? Class A
8. Name 5 examples of the fuel in a class B fire  
   Any combination of gasoline, tar, paint, lacquer, greases, oils and flammables gasses
9. What is the NFPA?  
   National Fire Protection Association

21. When you are going to extinguish a fire using a fire extinguisher, what 7 important points should you decide upon to help you make a flight or fight decision?   
a. The fire alarm is pulled and the building is being evacuated.

b. The fire department has been called (911).

c. The fire is small, contained and not spreading beyond its starting point.

d. The exit is clear, there is no imminent peril and you can fight the fire with your back to the exit.

e. You can stay low to avoid the smoke.

f. The proper fire extinguisher is immediately at hand.

g. You have read the instructions and know how to use the extinguisher

***Are our flammables stored safely?***

Look around your yard and inside your house. See if you can find any of the items on the list. If you do, write down where they are and in what kind of container it is stored.

*Students may, or may not, have a response to all of these material storage situations. Check only, but don’t provide a mark.*

Gasoline –

Varsol –

Methanol –

Paint Stripper –

Kerosene –

Diesel –

Propane –

Paint Thinner –

Pressure Treated Lumber End coat –

Stain –

Thompsons Water Seal –

De-greaser –

Glass Cleaner –

WD-40 –

Old Motor oil –

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