

A top-down view of a wooden workbench cluttered with various hand and power tools. In the upper right, a black and silver cordless power drill lies diagonally. To its left is a bright green tape measure. Below the drill are several gold-colored drill bits. On the left side, there's a red and black level, a pair of orange-handled pliers, and a pair of silver-handled pliers. In the bottom left, two hammers with wooden handles are visible. At the bottom right, there's a blue glue gun and a large yellow and green circular saw blade. The background is a light-colored wooden surface with vertical grain patterns.

YOUR HANDY BATTERY RECONDITIONING TOOLS GUIDE

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NECESSARY TOOLS AND WHERE TO FIND THEM



In preparing for the reconditioning process, you need to gather the tools, supplies, and equipment you'll need to keep in your work area. Having your supplies and equipment assembled ahead of time will help ensure a smooth process without any delays caused by looking for the things you need. Fortunately, the tools you need for reconditioning batteries are not expensive and are easily accessible at auto parts supply stores, at some large box discount stores, or online. Here's the basic list of supplies and tools you'll need and where to find them:

NOTE: These are just suggestions. Some of the tools are optional. Feel free to do your own research before starting.

THE MULTIMETER

The multimeter is a special electronic device that is used to measure several metrics within one device. In most cases, the conventional multimeter comprises of various components that can measure factors such as the current, resistance and even the voltage of a lead acid battery. The analog multimeter, which is



also known as a microammeter, uses a moving pointer to show the readings.

A digital multimeter comes with a unique numeric display and may show a graphic bar that represents the average measured value. Digital multimeters are now a common occurrence due to their high precision levels and affordability to get them.

An adequate multimeter can be purchased for around \$20 and will be a much-used tool for your battery reconditioning projects and other household tasks. A multimeter allows you to take several types of measurements including DC (direct cur-

rent) voltage, AC (alternating current) voltage, electrical resistance, DC or AC current.

Here's a general purpose Hand-Held Multimeter:

And here's another one that has Auto-ranging scales:

THE HYDROMETER

A hydrometer or aerometer is a tool to measure the specific gravity density of liquids in relation to the density of pure water. Furthermore, this tool is mainly made of unique glass and it consists of a cylindrical stem and a bulb that is filled with lead shot or mercury to enhance its buoyancy levels. Following this,



the liquid to be tested is then poured in a long container, and the hydrometer is then carefully lowered into the liquid until it achieves optimal buoyancy. The position at which the surface of the liquid is in contact with the stem of the hydrometer demonstrates the precise gravity amount.

A battery hydrometer can run anywhere from around \$10 upward to around \$30 depending on the type you purchase. The battery hydrometer is used to test the state of the charge of a battery cell. The hydrometer tests the charge by measuring the density of the electrolyte, which is accomplished by measuring the specific gravity of the electrolyte.

Here's a really simple and easy to read hydrometer:

And here's another one you can chose:

THE LOAD TESTER

This is an electronic tool that is used to test the state of an electric battery. In most cases, these tools are often available as basic testing devices that are perfect for DIY to advanced testers that can also determine the capacity of the battery to conserve charge and drawbacks that may be compromising the battery's performance.



A battery load tester can run anywhere from around \$40 up to around \$150 depending on the type you purchase. They can be found at auto supply stores, big box stores, or online. Load testing is done to verify that the battery can meet its specified power when needed.

You can find a really good one here:

THE TERMINAL CLEANER



There are various tools that can be used to clean the battery terminal. If the terminal on your car battery is covered with acidic powder, you might have to clean it by putting some baking soda and water on the surface to neutralize the effects of the acid. Following this, you can then use a wire brush to clean off the effects of the acid and dirt as well.

A battery terminal cleaner is a wire brush that is made specifically to fit the battery posts for thorough cleaning. The cleaner costs just a few dollars and is a handy tool.

BATTERY CARRIER

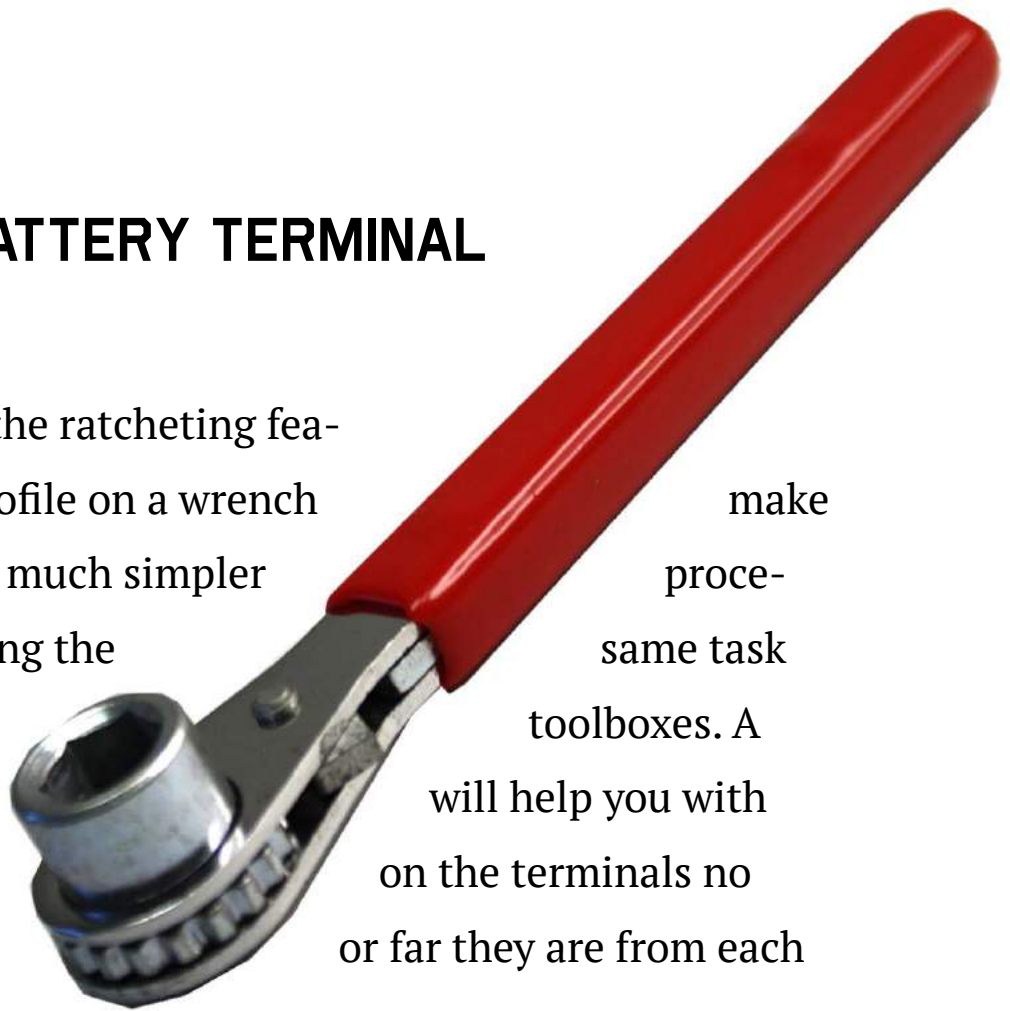
A carrier is a special tool designed to carry your battery without using your hands directly. Most battery carriers are efficient since they reduce any likelihood of acid burns and they provide a secure mechanism for carrying the battery. You should still wear protective materials when handling a carrier although this should be safer and easier to work with.



This will make your life easier:

SIDE POST BATTERY TERMINAL WRENCHES

Aside from safety, the ratcheting feature and a lower profile on a wrench terminal removal a much simpler procedure than attempting the using conventional terminal wrench keeping a grasp matter how close other.



make
proce-
same task
toolboxes. A
will help you with
on the terminals no
or far they are from each

Here's a good example:

**GIVE US THE TOOLS, AND
WE'LL FINISH THE JOB**

Winston Churchill

THE BATTERY CHARGERS:

You can find a simple 12V Battery Charger
here:

[Check It Out Here](#)



If you want to step it up you can chose a smart
charger like this one:

[Check It Out Here](#)



HINT: INVESTING IN A GOOD SMART CHARGER

A smart battery charger is mainly a switch mode supply unit that can communicate with your unique battery systems in order to monitor and regulate the charging procedure. This communication between the battery part system and charger is important since it determines the efficiency of the entire charging procedure. Aside from the conventional positive and negative terminals, a smart charger also comes with several terminals that can be connected to the smart battery pack system.

In most cases, the smart charger often consists of a charger case, which houses the internal components of the charger. Besides that, this unit

also features large capacitors, circuit cards and transformers that might sometimes weight well over 100 pounds each. In some cases, the high-end charger might sometimes comprise of well over four transformers that can be found in the conventional chargers and diodes as well. The transformers that are found in these chargers will transform the AC electricity into DC electricity. More so, these units



also come with digital displays that indicate the vital metrics of the battery and the chosen charge cycle levels.

Some of the high-end smart chargers come with various accessories and chargers to suit various types of batteries chargers. These include the models that are used in bikes, marine vessels and vehicles as well. More so, the high-end chargers will provide a broad spectrum of functionalities and user benefits as well. Some these are fully automatic, reverse polarity controlled and spark proof as well.

The added benefit is that these tools are simple to use. Due to the patented pulse maintenance features, the range of chargers is strong enough to where they can be connected to batteries for several months without losing their functionality.

A smart battery charger will expedite various steps during the charging procedure to revive, recharge, charge and desulfate the battery. This helps to prolong the battery life and saves time and money in future. Additionally, a smart battery charger can stay in constant communication with the BMS system all throughout the entire charging procedure. In this way, users can charge to meet the needs of the battery and therefore mitigate the effects of over and under charging as well.

OTHER NECESSARY TOOLS:



Plastic funnel
for pouring
chemicals

[Check It Out Here](#)

Screwdriver
for removing
battery cell
caps.



[Check It Out Here](#)



**Battery Probes And
Alligator clips:**

Epsom Salt: (Magnesium Sulfate)





Brake Cleaner Spray:

Electric Kettle:



YOU'LL ALSO NEED:

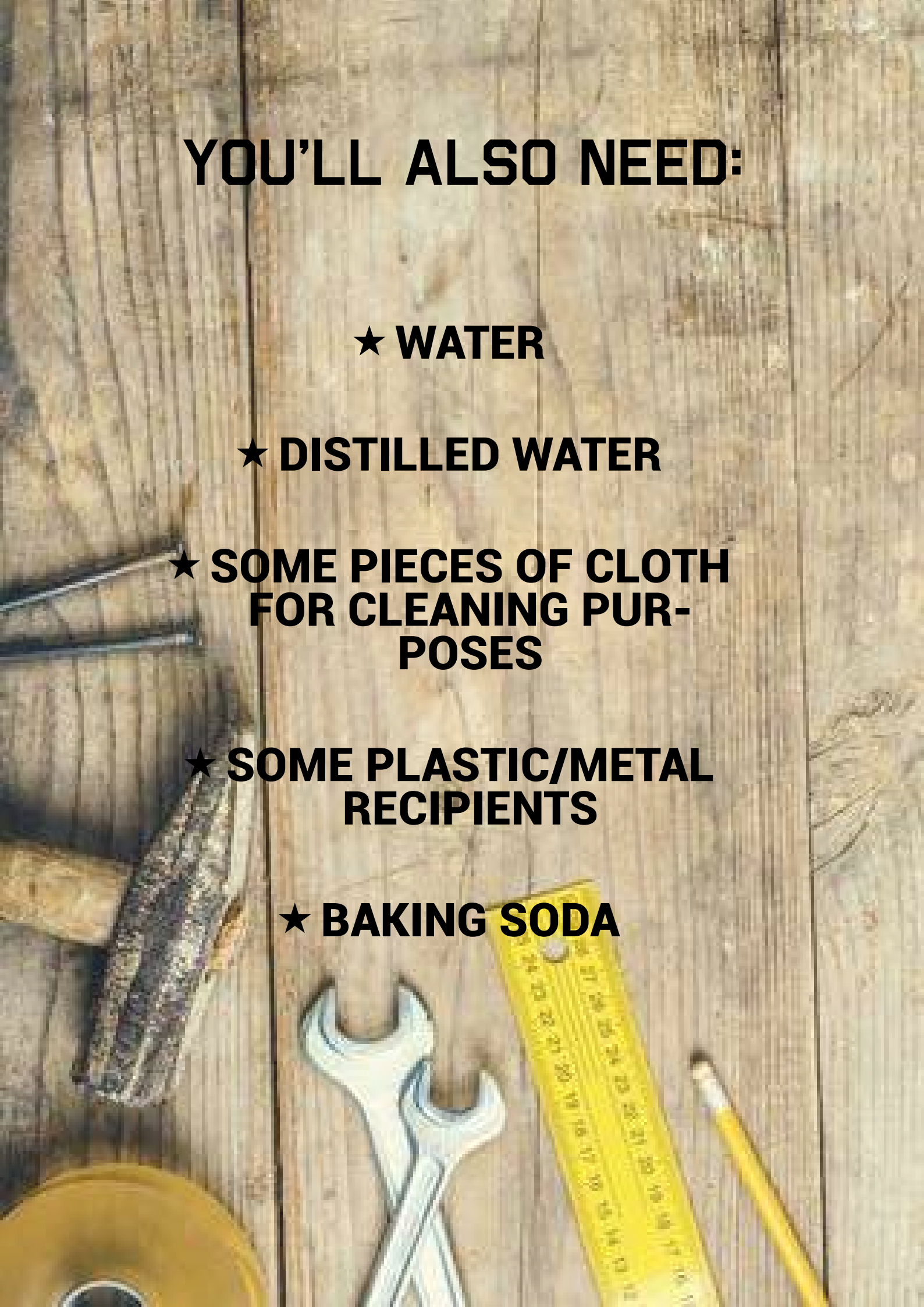
★ WATER

★ DISTILLED WATER

**★ SOME PIECES OF CLOTH
FOR CLEANING PURPOSES**

**★ SOME PLASTIC/METAL
RECIPIENTS**

★ BAKING SODA



DON'T FORGET ABOUT YOUR SAFETY:

You have to handle your batteries with the appropriate amount of care. In fact, you are not supposed to pour more than the stipulated amount of sulphuric acid into your battery amount since this might lead to an overflow.

More so, when you are charging your lead acid batteries, ensure that you charge your batteries in an area

with sufficient ventilation mechanisms. In this way, you can easily mitigate the effects of sulphuric gas in the air, which might compromise your health.

Another notable factor to consider is that you should also use the appropriate protective clothing. For instance, ensure that you have gloves that cover your hands and

reach all the way up to your elbows.



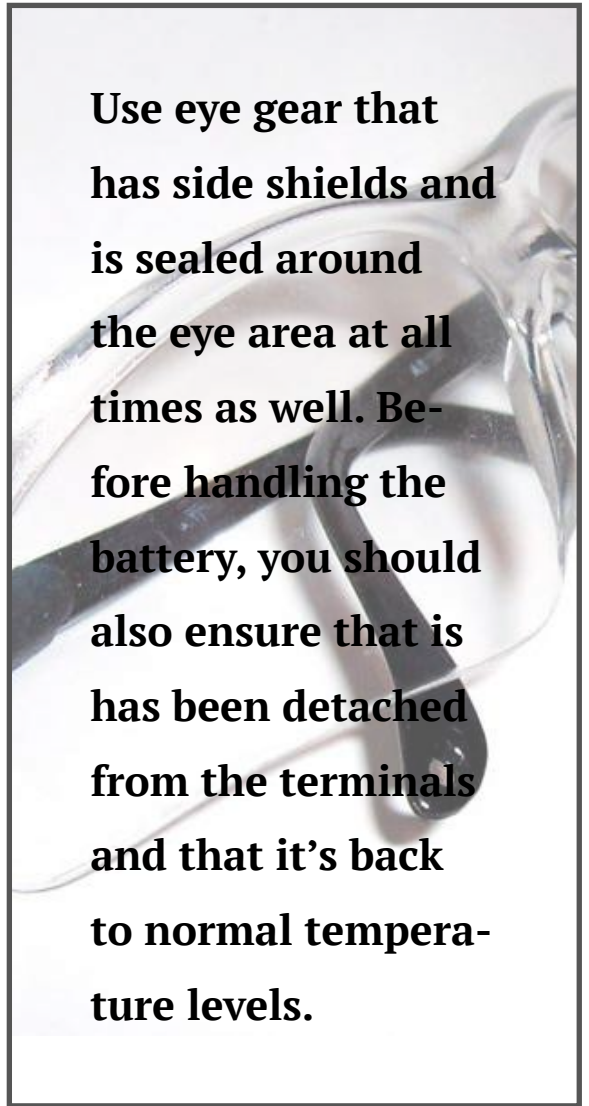
You must not smoke while working with the batteries, especially when charging them. An explosion could occur if the gas that is produced during the charging session comes into contact with the sparks or flames from a cigarette or cigar, etc.

Have a chemical spill response kit available to use in the event of a spill.

Have an eye-wash kit available in case you get acid splashed in your face or eyes.

Be extremely cautious when taking care of your batteries. You must see that they are handled properly and with enough caution in mind.

Use eye gear that has side shields and is sealed around the eye area at all times as well. Before handling the battery, you should also ensure that it has been detached from the terminals and that it's back to normal temperature levels.



Again, keep an emergency First Aid kit available in your work-space that includes an eyewash kit and a hazardous waste kit. No matter how careful you are, accidents can happen, and you want to be prepared.



Below You Can Find Some Good Pair Of Gloves

Eye Protection Is Crucial

You should always have around a good emergency kit: